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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.

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Vol. 10. April 20, 1918. No. 1.

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WEEKLY REPORTS

Each field representative of the Office has been asked to make weekly report of cereal data, for use in this paper. In addition to the progress of station work and the condition of station crops, notes on the cereal situation are desired, when available, as follows:

General crop conditions in your locality and district;
Crop propaganda by official or commercial agencies;
Introduction of new crop varieties;
Location of good seed stocks;
Noteworthy increases in crop acreage, or changes in farm practice, incident to the war program;
Extensive areas of new land being brought under cultivation;
Introduction of labor-saving machinery, especially new inventions;
Special community efforts to solve the farm-labor problem;
and other similar matters of interest.

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PERSONNEL

The following notes present briefly the recent activities of the scientific staff, including additions and changes of location.

Ernest L. Adams resigned the superintendency of the Rice Field Station at Biggs, Cal., on March 31 to engage in private work in the Sacramento Valley.

Louis C. Aicher has recently made a trip through the wheat producing portions of Southern Idaho and reports the crop conditions good and all indications point toward an increased acreage of wheat.

C. R. Ball has been serving on the U. S. Seed Stocks Committee in connection with the locating and supplying of spring wheat seed.

Aaron F. Bracken, graduate of the Utah Agricultural College and assistant to Mr. Jones on the Nephi substation during most of the last two crop seasons, has been appointed superintendent of the substation and reported for duty April 7. Since June 1, 1917, he had been county agent in Morgan and Summit Counties, Utah.

L. R. Breithaupt resigned the superintendency of the Harney County Branch Station at Burns, Oregon, on January 31. His present address is Rural Route 3, Payette, Idaho.

M. A. Carleton is at present on furlough, engaged in private work.

Chambliss, C. E., left Washington March 15 on a trip through the rice growing districts of the Southern states, spending about two weeks at the Rice Experiment Farm at Crowley, La. He returned to Washington on April 14.

C. H. Clark left Washington April 11 enroute to Minnesota, North Dakota and Montana in the interests of flax seed supplies for the United States Seed Stocks Committee. He will proceed to the Pacific Southwest in the interests of flax investigations before returning to Washington.

J. Allen Clark recently has made two field trips for the U. S. Seed Stocks Committee in the interests of spring wheat seed. On February 26 he went to Buffalo to inspect several hundred thousand bushels of spring wheat held in storage there by the Food Administration Grain Corporation. Nearly 500,000 bushels of this was approved for use for seed purposes. On March 9 he made a trip to Minneapolis and thence into South Dakota for the purpose of locating additional stocks of Marquis and other spring wheat varieties. He returned to Washington on March 24.

N. C. Donaldson resigned as scientific assistant in charge of cereal investigations at the Judith Basin Substation, Moccasin, Montana, on March 15, to engage in farming in Montana.

A. D. Ellison, scientific assistant in charge of cereal investigations on the Arlington Farm, Va., resigned October 5, 1917, to enter the army where he is now engaged in gas defense work.

Victor H. Florell has been at the Agricultural College, Manhattan, Kans., since January, where he is engaged on special work connected with cereal disease investigations. He will proceed to Archer, Wyo., in the near future to sow the spring cereals and will then return to Manhattan.

J. Mitchell Jenkins, formerly scientific assistant in charge of rice investigations at Crowley, La., has been made superintendent of the Rice Field Station there, his appointment taking effect February 16, 1918.

J. W. Jones has taken the superintendency of the Rice Field Station at Biggs, Cal., and left Nephi, Utah, on March 28 to assume his new duties. He has been succeeded at Nephi by A. F. Bracken, as noted previously.

F. A. Kiene, Jr., Assistant Agronomist in charge of the cereal investigations of this office at the Hays Branch Station, Hays, Kans., left Hays on April 10 for Newell, South Dakota, to sow the spring cereals in the experiments on the Bellefourche Experiment Farm. After completing his work there he will return to the Hays station.

C. E. Leighty, agronomist in charge of Eastern Wheat Investigations, returned to the office April 1, after having accompanied Pres. W. O. Thompson of Ohio University, on a tour through the northwestern states in the interest of increased agricultural production.

Edgar S. McFadden, a graduate of the South Dakota Agricultural College, has been appointed an agent of this office and placed in charge of the cooperative experiments on the Highmore Substation at Highmore, S. Dak., where he succeeded J. D. Morrison. Mr. McFadden has been assistant in cereal investigations at Brookings and has some interesting work in wheat breeding in progress.

J. H. Martin has been transferred to the Harney County Branch Station at Burns, Oregon, where he becomes superintendent and agent of this office, effective April 11, succeeding L. R. Breithaupt who resigned January 31. Since early in January Mr. Martin has been located at 320 Flour Exchange, Minneapolis, Minn., where he has been identifying wheat varieties in connection with samples submitted by elevators for approval with a view to storage under the modified license of the Grain Corporation. This work has been done for the U. S. Seed Stocks Committee.

J. D. Morrison resigned his position in charge of the cooperative work in cereal investigations at the Highmore Substation on March 11, to engage in farming on an extensive scale at Philip, South Dakota.

B. E. Rothgeb, scientific assistant in Grain Sorghum Investigations, left for Oklahoma and Kansas in March to assist in the purchase and resale of sorghum seed for the U. S. Seed Stocks Committee. He is now located at Clinton, Okla., in charge of the resale of seed in storage at that point.

F. J. Schneiderhan, who has been assisting in cereal breeding at the Eastern Oregon Substation at Moro, resigned on December 15 to enlist in the army. He is engaged in the gas defense service and is now located in Philadelphia.

C. W. Warburton, agronomist in charge of Oat Investigations, left Washington about January 1 to engage in the purchase and resale of seed oats and barley for the U.S.Seed Stocks Committee. He has bought over 500,000 bushels of oats and about 100,000 bushels of barley which have been resold in the drought-stricken portions of North Dakota and Montana. He is now engaged in the purchase of seed corn and flax for use in the upper Mississippi Valley. His address is 320 Flour Exchange, Minneapolis, Minn.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION.)

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Vol. 10. May 10, 1918. No. 2.

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This issue of the Courier is devoted largely to summaries of progress and conditions on field stations during April. As heretofore, the stations are arranged in three groups, located respectively in the humid eastern States; the Great Plains area; and the regions west of the Rocky Mountains.

The scope and frequency of issue of the Courier have not been finally settled. The tentative plan includes three issues each month: on the 10th, 20th, and 30th, respectively. It is planned that the issue of the 10th shall contain reports of the field stations for the previous month. In the issue of the 20th it is expected to cover interesting matter concerning the different cereal crops and cereal diseases. The final issue of each month probably will contain special memoranda and other matters not directly connected with either the field station work or the cereal projects. The plan outlined is not permanent, but tentative, and suggestions will be welcomed. Owing to the pressure of emergency work it was necessary to omit the issue of April 30.

Although under the plan outlined above reports from the field stations will be issued only on the 10th of each month, it is desired that men on field stations report to the office twice a month, on the 15th and 30th, respectively. The report on the 30th should be mailed very promptly in order that there may be no delay in preparing copy for the Courier.

PERSONNEL.

C.R. Ball has been appointed Cerealist in Charge of the office of Cereal Investigations, effective April 16.

C. E. Chambliss left on May 8 for Lonoke, Arkansas, in response to a request from the Office of the Surgeon-General of the army, to report on the possibility of irrigating rice fields in that section by methods which at the same time will give the least opportunity for the breeding of mosquitoes.

Ross R. Childs, Scientific Assistant in charge of the cooperative cereal investigations at the Georgia College of Agriculture, Athens, Georgia, resigned on April 18 to enlist in the photographic section of the Signal Corps.

Franklin A. Coffman, Agent, in charge of cereal investigations at the Akron Field Station, Akron, Colo., has been appointed Scientific Assistant in Plant Breeding; effective April 16. He will continue in charge of the experiments at Akron.

Professor L. A. Fitz, formerly of the staff of this Office, but now head of the Milling Department of the Kansas Agricultural College, was a visitor on May 2.

Dr. E. M. Freeman, formerly in charge of Cereal Disease Investigations, now pathologist of the Minnesota Experiment Station, was in Washington on May 3 and discussed the cooperative work in cereal diseases conducted in Minnesota.

Prof. G. M. Hoffer, Agent in charge of corn-disease investigations at LaFayette, Indiana, was in Washington recently.

C. W. Hungerford, Scientific Assistant in charge of stripe-rust infections, has been temporarily transferred to assist Dr. Stakman in the direction of the barberry campaign, with headquarters at University Farm, St. Paul, Minn. During his absence from Corvallis the stripe-rust work is temporarily in charge of Mr. C. R. Hursh, until recently field assistant in the Oregon smut-control campaign.

Professor Duncan S. Johnson of the Department of Botany, Johns Hopkins University, has recently been appointed leader in charge of the smut campaign squad assigned to the field survey work in the Atlantic Coast States. He is assisted by F. D. Blaine, until recently in charge of the smut campaign in Colorado.

Ralph J. Morgan, until recently a member of Mr. Reddy's smut campaign staff in North Dakota, has been assigned to the district leadership of field assistants conducting a smut survey in Mississippi, Alabama, Tennessee, Kentucky and the States lying immediately to the north of Kentucky.

Walter K. Noë of Cincinnati has been appointed Clerk (Stenographer and Typewriter) in this Office; effective May 3. During the past few years he has been secretary to Governor Harmon of Ohio, both during his term as Governor and during his term as receiver of the Chicago, Hamilton, and Dayton Railway.

Charles S. Reddy, Scientific Assistant in charge of flax disease work at Fargo, N. Dak., has recently been transferred to the smut campaign work. He is District Leader in charge of a squad of field assistants now conducting a field survey in the Texas-Oklahoma-Dakota district.

B. E. Rothgeb, in charge of Grain-Sorghum and Broomcorn Investigations, who had been assisting in the purchase and resale of sorghum seed in the Southwest for the U.S. Seed Stocks Committee, returned on April 20 to prepare plans for some emergency work in increasing grain-sorghum acreage and production.

Dr. E. C. Stakman, now in charge of the emergency campaign for barberry education and eradication, was in Washington recently for several days planning for the extension of the work. His headquarters are at University Farm, St. Paul, Minn.

C. W. Warburton, who since January 1 has been engaged in the purchase and resale of seed grain at Minneapolis for the U. S. Seed Stocks Committee, returned to Washington May 9 for conference. He is at present engaged in the purchase and resale of seed corn in the upper Mississippi Valley. His mailing address is Iowa State College, Ames, Iowa.

H. M. Woolman has been appointed to the position of Leader in charge of the Oregon smut campaign, with headquarters at Corvallis.

HUMID EASTERN STATES.

LOUISIANA.

Crowley Rice Station, Crowley. Dry weather during the winter, and consecuent low water in streams and lakes caused some uneasiness among rice farmers because of the possibility of salt water backing up. Rains beginning on April 6 relieved this condition somewhat, but also delayed seeding until about the 12th. Some farmers who had sown rice just before the rain were obliged to reseed on account of the cool weather and north winds, which formed a heavy crust, resulting in poor stands. Frost occurred on two nights. A rain of over 5 1/2 inches occurred on April 17 . This was one of the heaviest rains ever recorded at Crowley, the greater part of it falling within two hours. While it relieved the fear of damage from salt water, it prevented seeding for ten days or more, and was followed by temperatures too low for good germination. Precipitation to April 20 was 7.2 inches, which is more than has been recorded previously for the entire month of April since the station was established.

GEORGIA.

State Experiment Station (Athens) and Sub-Stations. Mr. R. R. Childs, Scientific Assistant, has resigned to enter the Photographic Section of the Signal Corps. He left Georgia on April 18 for Sackett Harbor, New York. Just before leaving Mr. Childs visited the field stations in south Georgia, and reported that crops there were in very good condition, although the oats were somewhat damaged by the severe cold last winter. Wheat throughout the state is in good condition, and the outlook is considered promising for a good crop.

NORTH CAROLINA.

West Raleigh. No report received.

VIRGINIA.

Arlington Farm, Roslyn. Marquis spring wheat and Abruzzes winter rye were sown on March 30, in single fortieth-acre plats. Favorable weather during April has resulted in marked improvement in the condition of winter grains, particularly winter wheat, in the experimental

plats on the Farm. The stands of the less hardy varieties of winter oats and barley have been decidedly reduced by winterkilling. Stands in many of the less favorably located plats of wheat have also been somewhat reduced by winterkilling. All of the earlier varieties of winter rye and barley were heading at the end of April. The removing of weeds from the nurseries, trimming of field plats, and the setting of labels was in progress.

Notwithstanding the favorable weather conditions which have prevailed rather generally since March 1, winter wheat in the portions of Maryland and Virginia contiguous to the District of Columbia is not looking promising. Stands generally are poor and the plants do not look vigorous. The shortage and high cost of fertilizing material last autumn may be partly responsible for this condition, since the successful growing of wheat in this section depends largely upon the use of commercial fertilizers.

NEW YORK.

Cornell Experiment Station, Ithaca. The winter wheat nurseries came through in fair condition. They were greatly helped by precipitation in early April. Most of the series of wheat hybrids also have over-wintered in good condition. Heavy snows throughout the central part of the State in early April delayed spring seeding somewhat. However, these snows were very beneficial to winter wheat and grass, as the ground was rather dry.

Wet weather at the end of April interfered somewhat with the spring work. Spring wheat in the rod-row series was sown April 27. The seeding of oat hybrids and rod-row selections in the plant-breeding garden was under way at the end of the month. A large number of new hybrids of oat and wheat varieties were being made in the green house.

A cereal nursery larger than ever before is planned for 1918. In addition to the barley and oats previously grown, spring wheat has been included because of the great interest in this crop. Many new hybrids of oats and barley which gave promise of being of commercial value are included this year.

Very extensive work in oat breeding will be conducted also in the northern part of the State, particularly in Jefferson, St. Lawrence and Franklin Counties, which are all big producers of oats. Continuing the work which has been under way for several years past, a number of samples of newly produced oats have been distributed to farmers for comparative experiments. Plat experiments in barley breeding will be started in Cayuga and Onondaga Counties, two of the heavy producers of barley. Many new selections will be sown in these nurseries.

MISSOURI.

State Experiment Station, Columbia. Crop conditions and crop prospects are considered the best in many years. The acreage of wheat is said to be the largest ever sown, while the acreage of corn is expected to be about normal. Wheat acreage is reported as 2,825,000 acres by the State Crop Report for April.

IOWA.

State Experiment Station, Ames. No report received.

GREAT PLAINS AREA.

TEXAS.

Amarillo Cereal Field Station, Amarillo. The winter was exceedingly dry. Only about a half-inch of precipitation was recorded from January 1 to March 28, inclusive. It was necessary, therefore, to delay the sowing of spring grain until sufficient moisture was available. Nearly an inch of rain occurred on January 29 and 30. The plats of spring wheat and oats were sown the first week in April. By April 13 wheat had emerged with a promise of good stands. The weather continued cool, the minimum temperature on the 19th being 31 degrees, and crop growth was exceedingly slow. On April 20 the prairies were beginning totake on a greenish tinge. The total precipitation from January 1 to April 13 was 1.74 inches at the Station. The soil contained enough moisture to work well and plowing and disking in preparation for row crops was in progress.

Winter Wheat and other winter grains were practicall all winterkilled. Only a few small fields in the vicinity of Amarillo will pay if left to harvest. Most of the land seede to wheat in the fall of 1917 will have to be resown in row crops. This will mean a greatly increased acreage of sorghums in the Panhandle of Texas.

OKLAHOMA.

Woodward Field Station, Woodward. Winter wheat whic survived the early spring winds apparently was in good condition on April 20 with promise for fair yields if normal conditions prevailed until harvest time. Cold and rainy weather prevailed from April 15 to 20, the precipitation being 1.7 inches during that time.

On April 16 the first plats in the date-of-seeding experiment were sown. These included single plats of Acme broomcorn, Dwarf milo, Sunrise kafir, and Sumac and Red Amber sorgos. The cold and wet weather following this seeding had a bad effect on germination. Apparently the Sunrise kafir and most of the Dwarf milo rotted in the ground. The sorgos and broomcorn probably will make a fair stand. They seem able to withstand more unfavorable soil conditions than do kafir or milo. The second series of plats in the date-of-seeding experiment was sown on May 1. The land to be occupied by the varietal and other experiments of the grain sorghums and broomcorn was plowed at about the same date.

KANSAS.

Fort Hays Branch Station, Hays. Winter wheat on the experiment station has survived in good condition. Good rains in mid-November, with succeeding warm weather, brought up late sown wheat. December was dry and very cold, while January was very cold but with more than the usual precipitation, 0.8 of an inch in all. This occurred as a heavy snow on January 10. A heavy snowfall occurred again in February, providing a total of 1.15 inches of moisture, while a good rain fell on March 3. On March 18 all wheat on the station was looking unusually well except one 80-acre field sown on corn stubble. Reports from wheat in the country are not so favorable. There is some very good wheat, mostly sown on early plowing, where the ground was packed by rains in August and afterwards disked before seeding. There has been some blowing of soil, especially to the south and west of the station. Reports from Trego and Gove counties indicate much dead wheat. There is a brisk demand for seed of barley, corn, and sorghums. Good rains occurred at the end of March.

The farmers' round-up was held at the station on April 10. Fully 2,000 people attended; 250 autos were parked on the grounds; and lunch was served to nearly 1,500 persons. President Jardine; the State Manager and all members of the Board of Regents; ex-Governor Stubbs; Governor Copper; and Secretary Mohler of the State Board of Agriculture; together with many men from the Agricultural College and Experiment Station were present.

On April 10, Mr. Kiene left for Newell, South Dakota, to do the spring seeding of cereals on the Bellefourche Experiment Farm. He returned to Hays April 28, having visited the Cheyenne Experiment Farm, at Archer, Wyoming, on April 26.

COLORADO.

Akron Experiment Farm, Akron. The stands of winter wheat in the experimental area are better on the whole than was expected from the condition last fall. Some plats, however, have very poor stands. In the nursery a large percentage of the Winter Ghirka, C.I.1438, did not survive. Poor stands occurred also in all the late sowings of Kharkov, Kanred, and Crimean.

At the end of April the condition of winter wheat in the experimental plats was excellent. Winterkilling was not very extensive at the plats, although the stands in the nursery were considerably reduced. At the end of April the plants were tillering so fully that apparently there was some danger of too heavy stands. Sufficient moisture fell during the month to keep the soil in good condition.

All of the spring grains emerged during the first half of April with good stands, and at the end of the month were growing excellently. Conditions in the spring nursery are equally favorable. The month of April was cool but with sufficient moisture and hence favorable for wheat. Two snow storms in the last week of April provided a total of .24 of an inch of precipitation. The minimum temperature of 25 occurred April 27 and 28, while wind velocities during the latter part of the month were high.

The condition of both winter and spring wheat in northeastern Colorado is considerably above normal. Many farmers fear that, with the abundant tillering, stands will be too thick, and have turned their cattle on to the wheat fields as a precautionary measure. Spring wheat prospects are excellent. Most of the spring wheat was sown during the latter part of March.

WYOMING.

Cheyenne Experiment Farm, Archer. Mr. Florell went from Manhattan to Archer about the middle of April to do the seeding of spring cereals. He reports that the winter in that section had been warmer and less windy than usual, with only light snowfall. Mild temperatures prevailed during March, with consequent starting of pasture grasses, while in April the precipitation exceeded 4.25 inches. Snow fell nearly every day in the latter part of the month.

Cheyenne Experiment Farm, Archer (Cont'd).

On the station, winter wheat and rye were only in fair condition. Considerable injury resulted from drought during fall and winter and also to some extent from soil-blowing. Wheat on fallow is in the best condition, the series of plats on stubble land having been too dry at seeding time. The sowings of August 15 and September 1 in the date-of-seeding experiment are much superior to the later sowings, several of which show no survival. All spring cereals susceptible to smut infection were treated by the formaldehyde spray method. Poisoned oats to destroy squirrels were placed around and in the experimental area, with good results. Mr. Florell expected to complete work and return to Manhattan about May 10.

SOUTH DAKOTA.

Bellefourche Experiment Farm, Newell. Mr. Martin, having been promoted to the superintendency of the Harney Branch Station at Burns, Oregon, left Newell on April 13. Arrangements had been made for Mr. Kiene to proceed from Hays to Newell to do the spring seeding, and he arrived there on the thirteenth also. Mr. Martin had prepared the seed for sowing, and the land also had been prepared. Rainy weather prevented immediate seeding of the experimental area. The seeding of the plats in the regular experiments was completed on April 24th, and Mr. Kiene left for Hays by way of Archer, Wyoming.

The sowing of flax plats and the plats in the late date-of-seeding experiments will be done through the courtesy of the representatives of other offices.

Cottonwood Sub-Station. All winter wheat winter-killed, but rye over-wintered with a fairly good survival. Spring work was delayed by snow and light showers during most of April, as well as by shortage of labor. In general, however, the sowing of wheat was nearly completed in Jackson County before the bad weather began.

Highmore Sub-Station. Survival of winter wheat was quite variable, but there appears to be no complete winter-killing. Rye survived in good condition. Most of the rotation, fertilizer and varietal plats of spring grains were sown during the first half of April. Most of the small plats and nursery rows had been sown by April 24. An extensive nursery of hybrid progenies and selections were sown by Mr. McFadden with material brought from Brookings.

Eureka Sub-Station. Winter wheat apparently had all winterkilled, although the question of survival of that under straw mulch in corn stubble had not been determined. Rye over-wintered with a fair stand. Weather conditions were favorable up to April 15 and seeding was well under way. In that section of the State it was farther advanced than is usual on that date. Rain and high winds delayed field operations at about the middle of the month, but nearly all the plats had been sown by April 24. Farm seeding in that section of the State was nearly completed on that date. A large quantity of pure seed grain was shipped from Eureka during the winter.

Brookings. Winter wheat on fall plowing entirely winterkilled, but on corn stubble a fair survival was had. Weather during late March and the first half of April was favorable, and the seeding of spring grain, including plat experiments and breeding nursery, was almost completed on April 18, and entirely completed on April 24. On the latter date the grains earliest sown were beginning to emerge. An increased acreage of Marquis Wheat has been sown in the Brookings district.

NORTH DAKOTA.

Northern Great Plains Field Station, Mandan. The wheat and oat varieties were all sown previous to April 15. Reports received indicate that most of the farmers had finished sowing their spring wheat by that date. A good rain, totaling 1.64 inches, fell immediately thereafter, and insured a good start for spring wheat and oats. Barley varieties were sown on April 27. The latter part of April was cold and cloudy, but wheat seemed to be emerging with satisfactory stands. Total precipitation during the month of April, 2.61 inches. Temperatures below freezing were recorded frequently.

Dickinson Sub-Station. The fall of 1917 was extremely dry, so that little fall plowing was done. The Spring was dry, but unusually warm, so that farming operations began about two weeks earlier than usual. Field work became general during the last week in March, and a large acreage of spring wheat was sown before the fifteenth of April. Much of this wheat was sown on spring plowing on corn ground or on disked flax stubble on last year's breaking. The moisture from the winter snows was sufficient to germinate seed sown

Dickinson Sub-Station (Cont'd).
in March, but the precipitation previous to April 15 was only about one-half inch. Twenty-five varieties of spring wheat and twenty-one varieties of oats were sown in triplicated thirty-second acre plats.

Beginning April 15 rain and snow fell for four days, totaling 1.75 inches. Cool and cloudy weather followed, allowing all this moisture to sink into the soil, and insuring good germination of grain sown during April. The total precipitation from April 1 to 20 was about 2.3 inches. Cool and windy weather, with freezing temperatures at night, occurred during the latter part of the month. The freezing was not sufficient, however, to interfere with farm work. Wheat in the varietal experiments emerged with good stands. A large acreage of spring wheat has been sown in this section of the State and is emerging with good stands. Seeding of the cereal nursery was begun April 26.

MONTANA.

Judith Basin Sub-Station, Moccasin. (Date from report of D.L.A. Investigations, April 13.) Precipitation during January was the highest on record, being more than three times the normal, while that of March was somewhat below. Considerable winterkilling seems to have taken place in winter wheat in the varietal experiments. Reports of the farmers indicate that winter wheat in the vicinity of Moccasin survived in good condition. The ground to be used for the spring cereal experiments was disked and harrowed during the week.

WESTERN BASIN AND COAST AREAS.

UTAH.

Nephi Sub-Station, Nephi. The condition of winter grain on the station is not very good, due to poor stands. In general, crop conditions in the Juab Valley are about normal. The stands of grain on most farms are better than were expected considering the very unfavorable moisture conditions prevailing last fall. Poor stands occurred, however, on a few farms. This may have been due to unfavorable fall conditions, to winterkilling, or to seed treatment for smut. The latter is thought to be the real reason, both on the station and in the surrounding territory. Those who used formaldehyde for smut control have very poor stands, while where untreated seed was sown or where copper sulphate was used in treatment the stands are fairly good. The sowing of spring grain in the plat experiments was completed during April.

IDAHO.

Aberdeen Sub-Station, Aberdeen. The station work is progressing slowly because men and teams cannot be obtained. Farmers are all busy putting in bumper crops. Weather conditions previous to the middle of April were less favorable than usual but much better than those prevailing at the same time in 1917. Precipitation was ample but temperature was low and grains and grasses not growing as rapidly as they should. The soil is in excellent condition and except for low temperatures grain is being sown under very favorable conditions on both irrigated and dry land. Seeding is practically completed on dry farms in this district. A larger acreage than usual of dry land spring grain is being sown, due chiefly to the dry fall which prevented much late sowing of winter wheat.

The acreage of wheat is being increased at the expense of alfalfa, peas, and sugar beets. This is due in part to the surplus of alfalfa hay carried over and in part to the fact that 1917 was an unfavorable year for peas. It is thought that the increase in acreage of wheat on irrigated land will exceed that of last year by over 20 per cent.

The station is having 65 acres of pure Trebi barley grown for increase, to be distributed in the fall. Two or three of the best oat varieties also are being increased for distribution.

Much new land throughout southern Idaho, especially in the irrigated districts, is being made ready for crop production. There has been a great increase in the use of small tractors, both on the irrigated and the dry lands.

OREGON.

Harney Branch Station, Burns. The new superintendent, J. H. Martin, formerly in charge of the work of this office on the Belle Fourche Experiment Farm, Newell, S.D., arrived at Burns on April 18. The absence of scientific men from the station had delayed spring seeding about two weeks. Plats on the dry land were ready for seeding and the first plats in the date-of-seeding experiments were sown on April 20. Irrigated land was being furrowed and will be irrigated before seeding. In the vicinity of the station most of the small grains had been sown by April 20 and part of them had emerged.

Sherman County Branch Station, Moro. No precipitation of benefit to crops has occurred since early in March. The total from March 1 to April 27 has been only .76 of an inch. April has been dry and cold for the most part. A temperature of 28 degrees was recorded on the fourteenth and 33 degrees on the twenty-fifth. The week ending April 27 was windy.

The surface soil is considerably drier than usual at this time of the year, but no crops are suffering yet from lack of moisture. There has been considerable complaint from farmers near the Columbia River in this (Sherman) and adjoining counties of injury to spring-sown grain from blowing of the soil. Soil blowing before midsummer is very unusual in this section.

The sowing of spring grain on the station was completed by April 20 and all except those recently sown had emerged with good stands.

There was no winter killing of fall-sown grains and winter wheat is in exceptionally good condition. According to a farm survey by the county agents, the increase over 1917 in the total wheat acreage in the Columbia Basin counties of Oregon is as follows: Umatilla, 30 per cent; Morrow, 36 per cent; Gilliam, 18 per cent; Sherman, 12 per cent; and Wasco, 14 per cent.

There has been a large increase in the acreage sown to Early Baart spring wheat in the drier sections of the Columbia Basin. In Sherman County last year there were only about 300 acres of Early Baart grown from seed distributed by the station. There were upwards of 6,000 acres of that variety sown in this county in the spring of 1918.

WASHINGTON.

Adams Branch Experiment Station, Lind. The spring has been dry and unusually windy. During March only .6 of an inch of precipitation occurred, and during April only .09, the normal total for the two months being about 1.8 inches. The reduced rainfall, together with excessive winds, have rapidly reduced available moisture. While crops are not in a critical condition the rain is needed badly.

Winds have been more frequent and destructive this spring than at any time during the past five years. Soil has blown this spring where blowing has not occurred before for a long time. Ordinarily the destructive blowing does not continue so late in the season and it is hoped that the worst winds are over. In the southern and western parts of Adams County some farmers are reseeding for the third time and if the winds continue it may mean practically financial ruin for some.

Adams Branch Experiment Station, Lind (Cont'd).

Spring seeding was finished by April 20. Plowing of plats was practically all done except for some of the later tests in the tillage experiments. Plowing stubble land for summer fallow was completed by April 27. Determination of moisture and nitrate formation in the tillage and fertility plats began about April 30.

The construction of 280 rods of interior fencing was completed April 27. It was built of 6-inch cedar posts set one rod apart with 26-inch woven wire below and two barbed wires at 9-inch intervals above. This completes the fencing program.

Owing partly to cool weather, wire worms have been very active in the spring grain and have very seriously damaged winter cereals. In fact, they have been more destructive in late sown winter grain than in spring grain, due probably to the fact that the ground sown in fall is very firm and moist and the temperature therefore lower than in the case of the looser and drier soil of the spring-sown plats. In the nursery it has become necessary to dig and destroy the worms to prevent complete loss. The two kinds seem to be about equally numerous but the larger ones are the more destructive. The number for a 17-foot row varies from 0 to 17, with an average of 3 or 4. If undisturbed, 2 or 3 individuals can completely destroy a nursery row in a week.

CALIFORNIA.

Plant Introduction Garden, Chico. A telegram from Superintendent R. L. Beagles under date of May 6 states that the cereal nursery is in good condition. This includes the extensive breeding and classification nursery of wheat; the large number of hybrids and selections placed there by Dr. Love of the Department of Plant Breeding, Cornell University, with whom this office is in cooperation; and the large barley nursery maintained by Dr. Harlan. The earliest barleys were ripening on the date named, while the earliest wheat varieties probably will ripen on or about May 31.

Victor H. Florell has been transferred from the Cheyenne Field Station at Archer to take charge of the important breeding and production experiments of this office at Chico. He will arrive there about May 20. The future program includes a considerable expansion both in the breeding work and in plat experiments.

Rice Field Station, Biggs. No report received.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. May 20, 1918. No. 3.

Project Issue.

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TO ALL MEN ON FIELD STATIONS.

MID-MONTHLY REPORTS. Please keep in mind, as stated in the last issue of the Courier, that mid-monthly reports of progress of work and condition of crops on the field stations are desired on the 15th of each month, chiefly for the information of the Office.

MONTHLY REPORTS. On the last day of each month a full monthly report is desired. This is for publication in the issue of the Courier on the 10th of the month following. Where it will save time and labor, the report at the end of the month may cover only the last half of the month, provided the report for the first half is of such nature that from the two a complete report can be made.

SPECIAL INFORMATION. Additional data on the special subjects mentioned in the first issue of the Courier may be sent at any time when they become available.

PERSONNEL.

John C. Brinsmade, Jr., Assistant in Flax Investigations on the Northern Great Plains Field Station, at Mandan, N. Dak., is now assisting C. H. Clark in the emergency extension work with flax in North Dakota and Montana.

C. E. Chambliss returned on May 20 from Lonoke, Arkansas, where he has been in conference with officials of the U. S. Public Health Service regarding the irrigation of the rice fields near the Ebert Aviation Field by methods which will prevent the breeding of mosquitoes and at the same time successfully produce the rice crop. This promises to be interesting from an agronomic as well as a sanitary standpoint.

Ross R. Childs writes, under date of May 9, that his address is Provisional Company No. 5, Aviation Section, Signal Corps, Madison Barracks, N. Y.

C. H. Clark left Minneapolis on May 16 for the Pacific Southwest in the interests of the winter flax experiments in Arizona and California. He will return by way of the Pacific Northwest, stopping about as follows: Davis, Cal., June 3; Chico, Cal., June 4; Corvallis, Ore., June 6. Thereafter he will proceed by way of Bozeman, Mont., to resume the emergency work with flax, with headquarters at 320 Flour Exchange, Minneapolis.

J. A. Clark has been placed in charge of Western Wheat Investigations in this office.

W. T. Craig, Agent in our cooperative experiments at the Cornell Experiment Station, will start for California on or about May 24 to study and harvest the extensive hybrid wheat nursery at Chico. Stops will be made at various State Experiment Stations en route. Dr. Love also will make the trip.

Victor H. Florell has been transferred to the Plant Introduction Garden at Chico, Cal., and will reach Chico about May 20 to take charge of the work in cereal investigations there.

H. B. Humphrey, Pathologist in Charge of Cereal Disease Investigations, left Washington on May 19 for a visit to several States in the Upper Mississippi Valley. On May 27 the leaders in the smut control campaign will confer at the Hotel Morrison in Chicago. He will return on May 29.

Corland D. Little was transferred to this office on May 18 from the Office of Crop Physiology and Breeding Investigations. He has been assigned to office work with Cereal Disease Investigations, where his long experience in the Bureau will be of immediate value in connection with the present pressure of emergency work.

H. H. Love, head of the Department of Plant Breeding at Cornell University, will proceed to California on or about May 24 to study and harvest his extensive nursery of wheat hybrids at Chico. Stops will be made at various Experiment Stations en route.

R. D. Rands, of the pathological staff of this Office, left Washington May 11 for points in the Southeastern States, to make investigations on scab and allied diseases of wheat. He will return about June 1.

Charles S. Reddy, in charge of the smut control campaign in the Great Plains States, with headquarters recently at Greenville, Texas, has accompanied C. H. Clark to Arizona and California to study flax diseases appearing in the experimental areas.

B. E. Rothgeb, in charge of Grain-Sorghum and Broomcorn Investigations, will leave Washington on May 21 for the Southern Plains States and the Pacific Southwest in the interests of emergency work with these crops, for which funds have been made available. He will proceed to the State Colleges and other points in Kansas, Oklahoma, Texas, New Mexico, Arizona and California, in the order named, to encourage larger acreage and production. He will return about June 30.

T. R. Stanton leaves May 21 for the South, to study the cooperative oat experiments and discuss future work with experiment station officials. He will also look into the condition of the winter oat crop with reference to the seed supply for next fall. He will return about June 10.

T. E. Stoa, in charge of cooperative flax rotations in North Dakota, temporarily is assisting Mr. Clark in the flax extension campaign in North Dakota and Montana.

C. W. Warburton returned to Washington on May 9 and left for Chicago on May 12, where he attended a conference on seed corn supply. He then returned to his work of purchase and resale of seed corn in the Upper Mississippi Valley, with headquarters at 320 Flour Exchange, Minneapolis.

VISITORS.

Professor E. G. Montgomery, head of the Department of Farm Crops at Cornell University, was an office visitor on May 20. He was en route from a visit to the Truck Experiment Farm at Norfolk, Va. Work with vegetable crops has been added to the Farm Crops Department at Cornell.

Professor A. E. V. Richardson, Agriculturalist of the State Department of Agriculture, of Victoria, Australia, has been spending two or three weeks in Washington during his tour of the United States. Professor Richardson has been connected with the Agricultural Department of Victoria for several years, and is the author of Bulletin No. 22, entitled "Wheat and its Cultivation," a well illustrated volume of 160 pages.

N.B. ON MAY 31 MAIL THE MONTHLY REPORT OF YOUR STATION.

CEREAL INVESTIGATION PROJECTS.

The projects of the office are as follows:

210. Supervision (Administration of Office, Laboratory, and Field Stations)

211. Production and Improvement of Cereals, Flax and Broomcorn, and their products

- 211-A. Wheat Investigations
- 211-B. Oat Investigations
- 211-C. Barley Investigations
- 211-D. Rice Investigations
- 211-E. Grain Sorghum and Broomcorn Investigations
- 211-F. Minor Cereal Investigations
- 211-G. Flax Investigations

217. Cereal and Flax Tillage and Rotation Investigations

218. Cereal Disease Investigations

- 218-A. Miscellaneous Cereal and Flax Diseases
- 218-B. Investigations of Cereal Rusts
  1. Rusts other than black and stripe
  2. Black and stripe rust
- 218-C. Investigations of Fungous and non-parasitic diseases of Grain Sorghums and Broomcorn (except rusts and smuts)
- 218-D. Investigations of cereal smuts

Emergency Cereal Disease Work

- A. Control of Cereal Smuts and other Cereal Diseases by Seed Treatment.
- B. Investigations of Thrasher Explosions and Fires.
- C. Campaign for Barberry Education and Eradication.

210. SUPERVISION.

At this date the personnel of the permanent staff of the office includes about 40 scientific men, 13 members of the clerical staff, and 3 messengers, making a total of over 55. Of the scientific staff about 30 are connected with the agronomic projects and 10 with the investigations of cereal diseases. In addition, there is a temporary force of 80 field assistants engaged in the smut control campaign and the work of barberry education and eradication. The number and the personnel of this field force changes from day to day owing to the emergency conditions under which the work is being done. Since May 1 the office has gained one clerk, Mr. Little, and lost one messenger, Joseph Topp.

The appropriations under which the work of the various projects is being conducted are as follows:

Agricultural Appropriation Bill, 1917-18.

General Cereal Investigations	$99,805	
General Cereal Disease Investigations	26,700	
Black and Stripe Rust Investigations	20,000	$146,505

Emergency Appropriations (Allotments from)

Smut Control Campaign	$103,500	
Barberry Education and Eradication	19,500	
Grain-Sorghum and other Cereal Emergency Work	5,000	128,000
		$274,505

The appropriations on the basis of which plans for the work of next fiscal year have been made are as follows:

Agricultural Appropriation Bill, 1918-19.

General Cereal Investigations	$ 99,805	
General Cereal Disease Investigations ...	26,700	
Special Corn Disease Investigations	25,000	
Black and Stripe Rust Investigations	100,000	
Barberry Education and Eradication	150,000	$401,505

Emergency Appropriation Bill

Cereal Production Emergency Work	53,250	
Cereal Smut Control Campaign	110,000	
Thrasher Explosion and Fires	10,000	173,250
		$574,755

The item in the Agricultural Appropriation Bill providing $150,000 for the barberry education and eradication campaign makes the the fund available immediately on the passage of the bill.

211-A. WHEAT INVESTIGATIONS.

The Crop Reporting Board of the Bureau of Crop Estimates, United States Department of Agriculture, makes the following estimates from reports of its correspondents and agents.

On May 1 the area of winter wheat to be harvested was about 36,392,000 acres, or 5,778,000 acres (13.7 per cent) less than the acreage (42,170,000 acres) sown last autumn, and 8,962,000 acres (32.7 per cent) more than the acreage harvested last year, viz., 27,430,000 acres. The 10-year average abandonment of acreage sown is 10.9 per cent, compared with 13.7 per cent this year.

The average condition of winter wheat on May 1 was 86.4 per cent, compared with 78.6 per cent on April 1, 73.2 per cent on May 1, 1917, and an average of 85.7 per cent on May 1 for the past ten years. A condition of 86.4 per cent on May 1 is indicative of a yield per acre of approximately 15.7 bushels, assuming average conditions to prevail thereafter. On the estimated area to be harvested, 15.7 bushels per acre would produce 572,539,000 bushels, or 36.9 per cent more than in 1917, 19.1 per cent more than in 1916, and 15.0 per cent less than in 1915. The out-turn of the crop is likely to be above or below the figures given above according as the conditions from May 1 to harvest are above or below the average.

Much of the 5,778,000 acres of winter wheat abandoned this spring was in the drier western portion of the United States. Most of the abandonment was due more to the drought of last summer and fall, which hindered germination or vigorous growth in the fall, than to the severity of the winter. 2,749,000 acres, or nearly one-half of the total acreage abandoned, lay in the hard winter wheat section of Kansas. This represents 29 per cent of the total winter wheat acreage of the State. In the hard winter wheat sections of South Dakota, Oklahoma and Texas, losses also were heavy. In Nebraska, Colorado, Wyoming and Montana, however, the acreage abandoned was unusually small. This is true also of the States in the Pacific Northwest.

Spring wheat seeding was from two weeks to a month earlier than usual in most sections. Weather and soil conditions were reported ideal. Sufficient seed was available for nearly all sections in ample time for seeding. Reports from many sources seem to indicate a record acreage.

The milling and baking of 340 samples of wheat varieties grown at twenty western field stations is just being completed at the millin laboratory conducted cooperatively by the Agricultural College of Nort Dakota and the Office of Grain Standardization, U.S. Bureau of Markets. The samples include eleven varieties grown in a uniform series at thirteen stations in the Great Plains area, and twelve varieties grown in a uniform series at six stations in the Western Basin and Coast area as well as miscellaneous samples of varieties locally adapted or newly improved. Mr. R. O. Smith of this office assisted in the work during the winter.

Dr. C. E. Leighty and Mr. J. Allen Clark represented the Bureau of Plant Industry at a conference in the office of the Chief of the Bureau of Markets, on May 8, concerning the construction and equipment of a Departmental experimental mill and baking laboratory.

Large classification nurseries are being grown this year at Arlington, Va.; Chico, Cal.; and Corvallis and Moro, Ore. At Corvallis and Moro the nurseries are in duplicate, one series being sown in the fall and the other in the spring. Both winter wheats and spring wheats are contained in the same series. This enables a more satisfactory study of varietal adaptations. With the exception of about 115 newly introduced foreign wheats, the nurseries contain only the wheat varieties of the United States. About 4600 sowings are contained in all nurseries combined. It is hoped that at the completion of this season's work sufficient information may be accumulated to justify publication.

Departmental Bulletin No. 618, entitled "Experiments with Durum Wheat," by Carleton R. Ball and J. Allen Clark, was received during April.

211-B. OAT INVESTIGATIONS.

According to recent reports of correspondents, winter oats in most sections of the South have over-wintered satisfactorily. In other sections, however, particularly in northern Georgia and Alabama, many fields were entirely winterkilled or too badly damaged to be left for harvesting. These have been sown to spring oats or other spring crops. In Northeastern Texas especially, the yields of winter oats will be much reduced as a result of long-continued drought.

In the breeding work with oats a larger number of head rows than usual have been sown this year at the Aberdeen Substation in Idaho. These mostly were derived from F_1 plants that were grown in the greenhouse at Arlington Farm, and from a large number of F_2 plants that were grown at Aberdeen last season. The hardy Winter Turf variety commonly has been used as one parent of these hybrids. It is thought that by crossing it with some of the best spring varieties a true winter oat more satisfactory than the Winter Turf may be developed.

Richland, one of the selections of the Kherson oat, developed in cooperation with the Iowa station, is now grown on a large acreage in that State, and to a less extent in other States. As this selection yields about 4 bushels to the acre more than the unselected Kherson, the estimated increase in production by the use of this selection is now at least 2,000,000 bushels annually. Similarly, a selection from the Welcome oat distributed from the Cornell station is now widely grown in New York. A high-yielding, very heavy, awnless winter oat selection has been distributed to a limited extent in Mississippi and Louisiana, under the name Aurora. It was developed at the Arlington Experiment Farm.

211-C. BARLEY INVESTIGATIONS.

The barleys in the greenhouse at Arlington have been harvested. It has been found feasible to grow the F-1 generations of hybrids in the greenhouse during the winter, and have them sufficiently mature for sowing in the field by the middle of May. This is sufficiently early for the more northern stations. Well developed plants are obtained in six inch pots. This season some plants attained a height of 150 centimeters to the base of the spike.

Galley proof of Farmers' Bulletin No. 968, on "Cultivation and Utilization of Barley," by Dr. H. V. Harlan, was read on April 27, and page proof on May 8.

211-D. RICE INVESTIGATIONS.

Under an agreement proposed by Food Administrator Hoover, which has been approved by the Southern Rice Growers' Association and the Rice Millers' Association, Government control of the rice market will become effective Oct. 1, 1918.

This agreement provides that the distribution of the 1918 crop shall be controlled by two representatives of the Southern Rice Growers' Association and one member of the Rice Millers' Association, who shall be appointed by Food Administrator Hoover, and whose decision as to grade shall be final, subject to review only by the Food Administration.

The producers have recommended the appointment of E. A. Eignus, Secretary of the Southern Rice Growers' Association, and J. H. Roman, District Manager of the Association at New Orleans; the millers, J. E. Broussard, President of the Rice Millers' Association.

Under the agreement the millers are allowed 50 cents for the milling of 162 pounds of rough rice, in addition to the by-products. They shall pay $7.25 for 162 pounds of No. 1 rough Honduras river rice and a corresponding price for other types and grades.

In order to prevent hoarding and profiteering, supplies of rice for only a limited period shall be bought, and the price at which clean rice, as well as by-products, may be held is fixed.

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At its annual meeting at Houston on May 14, the Rice Millers' Association extended its membership over the entire rice-producing area of the United States by admitting the twelve California mills.

211-E. GRAIN SORGHUM AND BROOMCORN INVESTIGATIONS.

Grain Sorghum production in the southern Great Plains area has been increasing rather rapidly in recent years. Probably the largest increase ever known occurred in 1917, when the total acreage in the six leading States was 5,153,000 acres, compared with 3,944,000 acres in 1916. This increase of about 30 per cent was due in part to the general campaign for increased food and feed production, and probably in still greater part to the heavy winterkilling of wheat in those States where grain sorghum acreage normally is large.

Grain sorghum acreage in the six States named, in 1916 and 1917, with total production in bushels in 1917, and total farm value of the 1917 crop on December 1:

State	1916	1917		
	Acres	Acres	Bushels	Total farm value Dec. 1
Kansas	1,332,000	2,126,000	31,890,000	$49,430,000
Texas	1,200,000	1,284,000	14,766,000	28,794,000
Oklahoma	1,114,000	1,400,000	22,400,000	31,360,000
Colorado	70,000	88,000	1,320,000	2,376,000
New Mexico	180,000	195,000	3,510,000	6,318,000
Arizona	48,000	60,000	1,980,000	3,564,000
TOTAL	3,944,000	5,153,000	75,866,000	$121,842,000

Because the grain sorghums are excellently adapted to dry-land conditions and profitable crops for dry-land farmers, an effort is being made to insure a large acreage this year. Mr. Rothgeb is proceeding to the Southwest in the interests of this campaign.

Galley proof of Farmers' Bulletin No. 958, "How to Use Sorghum Grain", by Carleton R. Ball and Benton E. Rothgeb, was read May 15.

Galley proof of Departmental Bulletin No. 698, entitled "Grain Sorghum Experiments in the Panhandle of Texas", by Carleton R. Ball and Benton E. Rothgeb, is being read. This Bulletin covers experiments conducted throughout a period of nine years on the Amarillo Cereal Field Station, and presents full experimental data, including a study of the effect of climatic factors on the development and yield of these crops.

Page proof of Farmers' Bulletin No. 972, entitled "Standard Broomcorn", by Benton E. Rothgeb, was read on April 27, 1918.

Broomcorn prices are the highest known in recent years. This is due to the cumulative effect of a short crop in 1916 and a rather short crop in 1917. Rumors that the Department of Agriculture, or the United States Food Administration had arbitrarily reduced the acreage of broomcorn this year are entirely without foundation.

211-F. MINOR CEREAL INVESTIGATIONS.

Buckwheat. The acreage of buckwheat grown in 1917 is estimated at 1,006,000 acres. This is an increase of about 178,000 acres, or 21.5 per cent over the acreage of 1916. Most of this increase occurred in the Appalachian States which form the buckwheat belt, especially Pennsylvania and New York.

The mimeographed circular on buckwheat culture, by Dr. C. E. Leighty, has been revised and a new edition run, under date of May 11.

211-G. FLAX INVESTIGATIONS.

Flax production in the United States in 1917 was the smallest known in the last 30 years. Owing to severe drought occurring over a large part of the flax-producing area, it amounted to only 8,473,000 bushels, compared with 14,296,000 bushels in 1916. The acreage in 1917, however, was an increase of 20 per cent over the acreage in 1916.

The annual requirements of flaxseed in the United States amount to 27 or 28 million bushels. Production has not equalled the requirements since 1912, when about 28,000,000 bushels were produced. The average production in the five years, 1913 to 1917, inclusive, was only 13,913,000 bushels, or almost exactly one-half the average annual requirements in the same period.

The lack of domestic production in flaxseed has been met in past years by importations from India and Argentina. Lack of shipping, or its diversion to the carrying of other material, has greatly reduced the quantity available for the transportation of flaxseed. It appears very desirable, therefore, to greatly increase the acreage grown in this country this year. The reduced production last year and consequent urgent demand have made it very important also to safeguard the seed supply for the coming season.

In order to encourage increased acreage and locate adequate stocks of suitable seed, Mr. Clark has established headquarters in Minneapolis with the United States Seed Stocks Committee, and a vigorous campaign has been inaugurated. Mr. Stoa and Mr. Brinsmade have been detailed to assist in the extension work in connection with increasing acreage.

Cooperation has been effected with the extension agencies in the States of Minnesota, North and South Dakota, and Montana; commercial agencies have been interested; posters prepared for use in advertising the flax situation, and sufficient seed supplies are thought to have been located. The situation is now believed to be well in hand. The early opening of spring, which permitted early sowing of small grain, has left the farmers free at an earlier date than usual to begin breaking sod on which to sow flax. Excellent rains over most of the flax belt have made breaking relatively easy and should make possible the preparation of a good seed bed. All indications at present point to a greatly increased acreage of flax this year.

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BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. May 31, 1918. No. 4.

Miscellaneous Issue.

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OFFICE ACTIVITIES

ALL MEN ON FIELD STATIONS please note that semi-monthly reports of Field Stations should be mailed on the 15th and the full monthly report on the 30th.

PERSONNEL.

J. A. Clark will leave Washington on June 1 for Manhattan and Hays, Kansas, Tucson, Ariz., Berkeley and Chico, Cal., in connection with Western Wheat Investigations. At Chico he will study the wheat varieties in the classification nursery.

Frederick C. Fishback, a graduate of Harvard University, 1918, has been given temporary appointment, effective May 24, and is engaged in making ash determinations of barley samples for Dr. Harlan.

Dr. H. V. Harlan will leave Washington on June 1 for the purpose of visiting the barley experiments at Blackburg, Va., Knoxville, Tenn., and Lexington, Ky.

Dr. H. B. Humphrey returned on May 29 from a ten-day trip in which he visited LaFayette, Ind., and Bloomington, Ill., conferring with collaborators concerning the progress of corn disease investigations now under way at those points. Stops were also made at Brookings, S. D., St. Paul, Minn., and Columbus, Ohio. On May 27 Dr. Humphrey attended a conference of representatives of the Bureaus of Plant Industry and Chemistry concerning investigations of smut and dust explosions.

Dr. C. E.Leighty will leave Washington on June 1 for Blacksburg, Va., Knoxville, Tenn., and Lexington, Ky., in the interests of Eastern Wheat Investigations.

Dr. H. H. Love and Mr. W. T. Craig, representing our cooperative work at the Department of Plant Breeding, Cornell University, started on May 25 for Chico, Cal., and other points in the West. The chief purpose of the trip is to study the very large number of hybrid projeny in the breeding nursery at Chico.

Titus B. Maxwell, of Rutgers College, New Brunswick, N.J. has been given temporary appointment as junior chemist, effective May 24, and is engaged in making ash determinations of barley samples for Dr. Harlan.

Dr. R. D. Rands returned to the office on May 25 from a trip in the Southeastern states for the purpose of investigating the occurrence of wheat scab and the injury caused thereby.

Dr. W. H. Tisdale of the pathologic staff, left Washington on May 25 for points in Georgia, Alabama, Florida and Mississippi in the interests of corn disease investigations.

VISITORS.

Wm. G. Bengel, formerly file clerk in this office, who enlisted in the D.C. Cavalry last July, was an office visitor on May 25. The cavalry squadron of which he was a member was organized as a battery of light artillery, and his training has been in that branch of the service. He has been stationed at Camp McClellan, Anniston, Ala.

Prof. A. E. Bowman, Director of Extension at the University of Wyoming, was a visitor at the office on May 27, conferring with reference to emergency work in field surveys for cereal seeds.

Prof. John T. Caine, III, Extension Director of the Utah Agricultural College, was a visitor on May 27 in the interests of extension work in locating suitable cereal seed supplies in Utah, through field inspection.

Prof. A. C. Cooley, Director of Extension at the New Mexico College of Agriculture, was in conference at the office on May 24 concerning emergency work with grain sorghums and locating and inspecting wheat fields for seed purposes in that state.

Prof. John R. Fain, Agronomist of the Georgia State College of Agriculture, was in Washington on May 24 and 25 for the purpose of conference concerning the experimental work in Georgia and a successor to Mr. Ross R. Childs, our representative there who recently enlisted in the Army.

Pres. C. C. Massie, of Northrup, King & Co., seedsmen, c Minneapolis, was an office visitor on the 29th, to discuss wild oats and other seed problems in the spring wheat belt.

Prof. E. P. Taylor, Extension Director of the Arizona College of Agriculture, was in conference at the office on Ma 23 concerning increasing grain sorghum acreage in New Mexico this season, and also on inspecting fields of Early Baart wheat for seed purposes.

Prof. C. Larsen, Extension Director of the South Dakota Agricultural College, visited the office on May 29 in connection with possible cooperation in field inspection of cereals for seed purposes.

MEETINGS.

An inter-bureau conference concerning the cooperative relationships of the smut control campaign will be held in Washington on June 3, 4 and 5. The leaders from the different campaign districts in the United States will be present. The field assistants from the Eastern district also will attend. A three-day program has been arranged, including representatives of the Bureaus of Chemistry and Plant Industry and the States Relations Service.

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N. B. MAIL STATION REPORTS ON THE 15TH AND 30TH.

CHANGES IN AGRICULTURAL PRACTICE.

IDAHO. The following notes on conditions in the Snake River Basin of Southern Idaho were furnished during April and May by Mr. L. C. Aicher, Supt. of the Aberdeen Substation:

April 16. Less field and garden peas will be planted in this section than were planted last year, due in part to the unfavorable season of last year and to the enlarged wheat program. A smaller acreage of alfalfa for seed will be grown this year than for the past two or three years. Less alfalfa hay will be produced this year than last. This is due in part to the increased wheat and sugar beet acreage, and to the surplus of hay carried over this spring. The mild winter figured largely, however, in the surplus of hay carried over. Most of the land being sown to alfalfa is now being seeded with Grimm alfalfa, it having been definitely found that the Grimm is much better for this section than the common alfalfa.

Much new land all over Southern Idaho is being made ready for crop production. This particularly applies to the irrigated sections of the State.

The Sugar Company is making strenuous efforts to increase the sugar beet acreage. The price of sugar beets has been placed at $10.00 per ton. Several hundred Mexican families have just been brought to Bingham County from Mexico. Small portable colony houses have been constructed by the Company for use in housing this help. As rapidly as work is completed in various sections, these small houses, made on the knock-down order, will be taken down and erected elsewhere. Just a few minutes are necessary to knock down or set up these houses. At Rupert, Idaho, a severe censure of the practices of the Sugar Company was drawn up in the form of resolutions at the meeting of the Minidoka Farm Bureau. There has been a great deal of agitation against the Sugar Companies for several months past, due, it is claimed, to the price paid for beets and the price the Companies have been getting for sugar. The average tonnage of sugar beets in Southern Idaho has been about 10 tons per acre, at $5.00 per ton, which was paid for beets two or three years ago. The sugar beet certainly was an unprofitable crop to a great many farmers. Ten-dollar beets, however, should be profitable.

The Sugar Company will grow a large acreage of beets for seed this year just a few miles North of Aberdeen. A very excellent quality of beet seed can be produced in this section, as evidenced by the results obtained at this Station for the past two years. Most of the beets to be grown in Idaho and Utah this year will be grown from seed produced in Southern Idaho and Utah.

May 4. "The Sugar Company lost several hundred tons of beets which had been siloed last fall as mother beets for seed production this year. The loss was due to overheating caused by the warm weather late last fall."

May 4. "Owing to the drought, the lack of water for sheep on the plains, where the range is still good, is forcing the sheepmen to trail their sheep towards the forest reserves considerably earlier than usual. Sheep shearing is going on at a lively rate. Hundreds of thousands of pounds of wool are piled up at the Aberdeen depot awaiting shipment. Most of the sheepmen are well pleased with the recent action of the Federal Government, commandeering the wool and setting the price between 60 and 65 cents. The clip in this section will be heavier than last year."

May 13. "Sheep shearing will be stopped in this section at the end of this week owing to the lack of water on the desert. The shearing camps will move to the mountains both because of the necessity of getting near water and of getting sheep to shear, as practically all the sheep have been moved to the higher elevations because of water shortage. Ordinarily, the sheep are not moved to the mountains until about the first of June. Only 50,000 head were sheared here this year. One man sheared 2,600 head in 10 hours (yearlings). The shearers receive 15 cents per head and their board. The sheep owners are paying 23 cents for shearing this year. Last year the costs varied from 15 to 18 cents. The wool fibre of the yearling sheep is not strong this year, breaking when a slight pull is exerted. Old ewe wool fibre is strong and apparently up to standard. Several reasons for this have been advanced, the most plausible being lack of feed at certain periods, causing wool to stop growing.

WASHINGTON. Mr. M. A. McCall, Superintendent of the Adams Branch Substation at Lind, reports on May 4:

"The high price of grain bags is leading to a certain amount of bulk handling agitation, although this immediate section does not show great activity in that direction. A few elevators are being built and some of the farmers are preparing to handle their grain in bulk, but the majority apparently expect to use sacks. With the approach of harvest there may be an increased activity for bulk handling, but at present the situation seems to be as indicated. Reports from other parts of the Northwest indicate greater activity for bulking elsewhere than exists here."

LABOR AND MACHINERY.

The following contributions from some of our field men will illustrate the existing conditions in several states:

MISSOURI. Mr. L. J. Stadler, our agent at the State Experiment Station reports on May 1:

"Special community efforts are being made to solve the farm labor problem. D. C. Wood, chairman of the farm labor committee of the State Council of Defense, is attempting through county representatives to place farm laborers in their home counties. He is also cooperating with representatives of the Federal Department of Labor in Kansas City and St. Louis, and with the State Bureau of Labor Statistics in St. Joseph. The Agricultural Extension Department is making a survey of available farm labor in towns and cities. Uel W. Lamkin, State director of the Boys' Working Reserve, will attempt to place high school boys on farms in the summer. The use of tractors is being considerably increased."

TEXAS. Mr. John F. Ross, Superintendent of the Cereal Field Station at Amarillo, reports under date of April 13 as follows:

"There is a move on foot, and already well organized, to help solve the farm-labor problem in this and adjoining counties by having every able-bodied man living in Amarillo volunteer to work a certain number of days on the farms in this vicinity. The farmer is to let his wants be known as long before hand as possible. The committee in charge will see to it that the men wanted are at his place when wanted, the farmer to pay the usual prices for farm labor to these men. Men unable to work but who have cars will be asked to transport the workers to and from their labor.

"The farmers are being urged by the county agents, the farmers' . institutes, the business men, and by each other to put forth their best efforts to produce the largest crop possible this year. They are fully alive to the situation."

KANSAS. "Steps for the systematic mobilization of farm labor in Kansas were taken at a meeting held in Kansas City May 14. This is the first of a series of meetings which are to be arranged by the Department of Agriculture in a number of cities to unite the efforts of all agencies working to secure labor to help farmers in harvesting their crops. At the Kansas City meeting a committee was appointed to direct the work of the various agencies in the State and to see that registrations are held in the cities, where city employees who will do farm work during their vacations can register. It is estimated that 80,000 helpers will be necessary to harvest the crops in Kansas

this year, and the commercial organizations in Kansas City have undertaken to supply 10,000 of this number." - Official Bulletin, May 28, 1918.

WYOMING. Mr. V. H. Florell, former superintendent of the Archer Field Station reported the following on May 4:

"Although farm labor is a little hard to procure there does not appear to be any particular scarcity. The State Labor Commission is well organized to care for emergencies which may arise. The greater number of counties in Wyoming have county agents. The county is divided according to communities, each of which has a chairman who looks after the labor situation in his locality. The community unit is small so that the actual need for labor should be well known and the community chairman is kept in close touch with the Commission."

IDAHO. Under date of April 16, Mr. L. C. Aicher, Superintendent of the Aberdeen Substation, wrote:

"There has been a great increase in the use of small tractors both on irrigated and on dry land."

OREGON. The following note on the labor and tractor situations in Sherman County, Oregon, come from Mr. D. E. Stephens, Superintendent of the Sherman County Substation:

"Due to the scarcity of farm help and the unusual amount of spring grain sown, farmers are considerably behind in their work of summer fallowing. About fifty percent of the ground to be summer fallowed has not yet been plowed. Much of this ground has not been disked and is now quite dry. On account of the scarcity of farm help, there have been a number of farm tractors purchased by farmers in Sherman County this spring. There are now upwards of 55 tractors in this County, 34 of which are of the caterpillar type. The majority of these are 75 horsepower Holt tractors. At present there is one tractor for every ten farms in the County."

WASHINGTON. On April 22, Mr. M. A. McCall, Superintendent of the Adams Branch Station at Lind, sent the following note:

"The labor situation has not been acute although there is not the labor available that has been in former years. The chief difference is in the poorer quality of labor and higher prices. In this section of Adams County wages are about $65 to $75 per month and board. I know of no work that has been abandoned because of labor shortage although several have been very much delayed getting some of their work done."

ANNOUNCEMENTS, MEMORANDA, AND REGULATIONS.

REQUEST TO LOCATE COMMERCIAL GROWERS OF VEGETABLE SEED.

May 23, 1918.

"Gentlemen:

In the development of the commercial vegetable seed marketing work, Professor Wheeler of the Bureau of Markets is endeavoring to locate commercial growers of such seed. This is necessary in order to be in position to secure war emergency reports from time to time as required in connection with inventories, acreages, etc. While a consicerable portion of the production of these seeds is in fairly well defined areas, the location of which is known, it is appreciated that new areas are continually developing and that a fairly continuous shifting of location of production is in progress. It has been suggested that if the representatives of this bureau in the field learn of such areas, prompt reporting of them to Professor Wheeler will be helpful in the development of his work, and it is desired that our men cooperate with him in this matter. As your field activities are, to a considerable extent, in the most important vegetable seed growing regions of the country, will you kindly notify your field men in this respect.

Very truly yours,
Wm. A. Taylor,
Chief of Bureau."

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10. June 10, 1918. No. 5.

Field Station Issue.

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OFFICE ACTIVITIES

TO ALL MEN ON FIELD STATIONS.

The cooperation of field station men in furnishing semi-monthly reports and monthly summaries of conditions and progress of work on field stations is greatly appreciated.

Reports from the men conducting the work on nearby Eastern stations can reach the office in two or three days after mailing, while reports from Far-Western stations are a week or more in transit. Since it takes several days to prepare all the material, men on Eastern stations are urged to mail their reports very promptly in order that they may be prepared while Western reports are still in transit.

PERSONNEL.

Frederick C. Fishback resigned his position as temporary junior chemist on May 31 to enter the Reserve Officers Training Camp at Plattsburg, N. Y.

Dr. H. V. Harlan returned to the office on June 8 from a seven-day trip into Virginia, Tennessee and Kentucky, during which he made field selections in Tennessee winter barley. The Tennessee winter barley at Arlington Farm having been more or less purified by previous selections it was thought that a wider range of types could be obtained now on farms in Tennessee and Kentucky.

Dr. H. B. Humphrey left Washington on June 10 to visit the agricultural colleges and experiment stations in the New England States in the interests of the smut-control campaign and for cooperative work in cereal disease investigations. He will return about June 17.

Dr. Duncan S. Johnson, Professor of Botany at Johns-Hopkins University and leader of the smut-control campaign in the Atlantic Coast division was in Washington on May 31 and again on June 3-5 to attend the conferences on smut control.

Edwin S. Landry, a graduate of the Agricultural Department of the University of Louisiana, class of 1918, has been appointed Field Assistant to assist in the rice experiments at the Crowley Rice Station under Superintendent J. M. Jenkins.

Dr. C. E. Leighty returned to the office on June 8 from a seven-day trip into Virginia, Tennessee and Kentucky where he visited the Experiment Stations. At Knoxville notes were made on the wheat hybrids and varieties. Wheat in Tennessee and Kentucky is very promising, especially in the latter state. In Tennessee the crop was quite seriously affected by scab. Some fields seemed to be rather free while in others the yield probably will be seriously reduced.

Prof. Wm. R. Leighty, First Assistant in Soil Analysis at the Illinois Agricultural Experiment Station, arrived in Washington on June 6 to engage in making ash determinations in barley samples for Dr. Harlan. This is the same work for which the appointments of Messrs. Fishback and Maxwell were noted previously.

E. S. McFadden, formerly in charge of cereal investigations on the Highmore Substation, Highmore, S. D., who was called for military service on May 25, is now located at Camp Lewis, Wash., and is attached to the 48th Company, 12th Bn., 166 Depot Brigade.

R. J. Morgan, leader of the smut-control campaign in the East-Central division, which includes the states from Alabama and Mississippi to Michigan and Wisconsin, was in Washington on June 3-5 to attend the conference on smut control.

Prof. Merritt N. Pope, formerly in charge of the Agricultural Department at the State Normal School, Eau Claire, Wis., has been appointed assistant in barley investigations, effective June 10. He will proceed at once to St. Paul, Minn., and thence to the Aberdeen Substation, Aberdeen, Idaho, to assist Dr. Harlan in the study of the extensive barley nurseries grown at those points. Professor Pope is a graduate of the North Dakota Agricultural College, of Northwestern University and of Harvard University, and has done plant breeding work in North Dakota and Minnesota.

Charles S. Reddy, leader of the smut-control campaign in the Great Plains area, from Texas to North Dakota and Montana, returned to the office on June 1 and will remain in Washington for a few weeks. Since May 16 Mr. Reddy has been assisting Mr. C. H. Clark in examining the flax seed held for distribution at the Chula Vista and Bard Experiment Stations in California, and at the Tempe and Sacaton Experiment Stations in Arizona.

Dr. E. C. Stakman, in charge of the Barberry Education and Eradication campaign, has returned to University Farm, St. Paul, Minn., from an extended trip through the central states as far South as the Gulf Coast. He reports encouraging progress in awakening interest in the effect of the barberry plants on wheat-rust epidemics. During his absence Mr. C. W. Hungerford had charge of the St. Paul office.

T. R. Stanton returned to Washington on June 8 from a trip in the Southern states in the interests of oat investigations. Mr. Stanton visited the Experiment Stations at Raleigh, Swannanoa, and Statesville, N. C., Clemson College, Florence, S. C., Athens, Ga., Auburn, Ala., Agricultural College, Miss., Jackson and Knoxville, Tenn., and Blacksburg, Va., also the Coker Seed Farm at Hartsville, S. C.

He reports that in most of the sections visited crop conditions were generally satisfactory. Where stands of fall-sown oats were reduced not more than 50 percent by winterkilling the remaining plants have tillered heavily and a normal crop of good quality will be harvested. Spring oats sown in February in fields where the fall-sown crop was damaged beyond recovery by winterkilling are looking unusually promising. The early but rather cool spring was particularly favorable to this crop and fortunately it will add considerably to the feed supply of the South. Some leaf rust was noted in oats but in most cases the infection was light and no serious damage will result.

In the territory covered apparently there will be no shortage in the supply of seed oats for next fall, with the possible exception of Northern Alabama. Apparently the usual practice for farmers of that section is to obtain most of their seed from Tennessee and the situation probably will take care of itself.

Prof. W. G. Stover, leader of the smut-control campaign in Ohio, formerly of the Department of Plant Pathology of the University of Ohio, was in Washington on June 3-5 to attend the conference on smut control.

C. W. Warburton returned to Washingtom on June 9. He has completed the work of purchase and resale of seed oats, barley and corn, on which he has been engaged since January 1. About 450,000 bushels of seed oats, 75,000 bushels of barley and 80,000 bushels of seed corn were bought and sold, involving a sum of about $1,600,000.

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Dr. Wm. H. Weston, Jr. is at present in the Orient on an extended investigation of the downy mildew diseases of corn and allied crops. He is now at Manila, P. I., care the Philippine Bureau of Science. He reports in his letter of April 22 as follows: "Now that I am finally in Manila I feel that work has really begun. In the two weeks since arriving here I have been orienting myself, finishing up the Guam work, and preparing to begin on the downy mildew.... The planting season is about to begin for the main crop of the year and since I am told the disease is prevalent this year around Los Banos I expect to find favorable material for work".

H. M. Woolman, leader of the smut-control campaign in Oregon, formerly in charge of the stinking-smut investigations which have been carried on in cooperation with the Washington State Experiment Station, was in Washington on June 3-5 to attend the conference on smut control.

George L. Zundel, leader of the smut-control campaign in the State of Washington, accompanied by his assistant, Mr. Noel F. Thompson, was in Washington on June 3-5 to attend the conference on smut control.

VISITORS.

Prof. R. K. Bliss, Director of Extension in Iowa, was an office visitor on June 10, to confer on prospective cooperative work in making a field survey to locate a suitable seed supply of certain cereal varieties.

Prof. G. W. Randlett, Director of Extension in North Dakota, was an office visitor on June 10, to confer on prospective cooperative work in making a field survey to locate a suitable seed supply of certain cereal varieties.

PUBLICATIONS.

Page proof of Farmers' Bulletin No. 972, entitled "How to Use Sorghum Grain", by C. R. Ball and B. E. Rothgeb, was read on June 5.

MEETINGS.

The annual Cereal Disease conference is scheduled for June 19-21, inclusive, and will be held at Purdue University, Lafayette, Ind. Mr. C. W. Hungerford, University Farm, St. Paul Minn., is conference secretary and any who desire further information concerning the details of the conference should correspond directly with him.

Smut-Control Campaign Conference.

Fourteen members of the pathologic staff engaged in the present Smut-control campaign participated in the conference in Washington on June 3-5, inclusive, together with other members of the staff of the Office of Cereal Investigations and representatives of the States Relations Service, the Bureau of Chemistry, and the Bureau of Markets. All of the district campaign leaders except Professor W. W. Mackie of California, and Dr. George M. Reed of Missouri, were present throughout the conference. The program given below was carried out in its entirety, with the exception of the part relating to seed treatment demonstrations at the Arlington Farm.

Monday Forenoon, 10 a.m.

Dr. A. C. True, Director, States Relations Service:
Extension Relationships between the States and the States Relations Service. (30 minutes).

Mr. Bradford Knapp, Chief, Office of Extension Work in the South:
The Functions and Duties of the County Agent.
How Our Organization Can Help. (30 Minutes).

Mr. J. A. Evans, Assistant Chief, Office of Extension Work in the South:
The Farmer's Point of View.

Monday Afternoon, 2 p.m.

Dr. H. B. Humphrey, Pathologist in Charge of Cereal Disease Investigations:
Cooperative Campaign Organization.

Mr. W. A. Lloyd, Agriculturist in Charge of County Agent Work, Office of Extension Work in the North and West:
County Agent Organization.

Mr. A. B. Graham, Assistant Agriculturist in Cooperative Relations, Office of Extension Work in the North and West:
Extension Methods.

Tuesday Forenoon, 10 a.m.

Mr. H. E. Roethe, Assistant in Grain Dust Explosions, Bureau of Chemistry:
Smut and Dust Explosions.

Mr. S. A. Regan, Scientific Assistant, Grain Standardization, Bureau of Plant Industry:
Clean Versus Smutty Grain from the Standpoint of the Market.

Mr. C. R. Ball, Cerealist in Charge, Office of Cereal Investigations, Bureau of Plant Industry:
Cereal Crops.

Tuesday afternoon was spent in the cereal plats and nursery on the Arlington Farm. Wednesday forenoon was given over to field and nursery observations on the Maryland State Experiment Station, the men returning to Washington in the afternoon for further conference on matters of unfinished business. All who attended the conference went away feeling that in every particular it had been a success and that as a result they had learned much that will be of great value to them in the further conduct of their work in the field.

It is now planned to hold two similar conferences later in the season, one at some point in the central West, the other probably at Corvallis, Oregon.

FIELD STATION CONDITION AND PROGRESS.

HUMID EASTERN STATES.

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins) The nursery rices were flooded during the last week in May to encourage germination. Since then light showers have fallen daily, which is resulting in a good stand. The other rice experiment plats mostly are up to a stand and the varieties on the increase plats are making good growth. Oat harvest has been delayed by the frequent rains at the end of May and if the weather continues wet much damage will result.

Mr. E. S. Landry, the new assistant, reported for duty at the Station about June 5.

GEORGIA.

State Experiment Station (Athens) and Substations. Owing to the resignation of Mr. R. R. Childs previously noted, a report from the Georgia station and substations for the month of May has not been received. The appointment of Professor Loy E. Rast as Collaborator, and Henry C. Lyon as Field Assistant, both effective June 1, insures that the work will now go forward without interruption.

(May 17). Some of the early barleys at the Station are ready to harvest and the earliest wheats in the nursery will be ripe soon thereafter.

NORTH CAROLINA.

West Raleigh. (G. M. Garren) The cooperative cereal work on the North Carolina Experiment Station for the season of 1917-18 consists of 36 twentieth-acre plats, 16 of oats and 20 of wheat, on the Piedmont Substation, at Statesville, N.C. There are also 16 plats of oats on the Coastal Plain Substation at Rocky Mount, N.C. The wheat plats at the Piedmont Substation were very promising when last visited, on May 10, but the oats had been badly winterkilled. Harvesting will be done about June 10-12.
In general the oat plats at the Coastal Plain Substation when last visited were not very promising. They lacked vigor and were seriously affected with rust. Harvest will occur there about June 7.

The wheat crop through the Piedmont and mountain sections of North Carolina, according to the reports that have reached the Station, has not been more promising in years. Mr. F. T. Meacham, the assistant director in charge of the Piedmont Substation, stated on May 10 that the prospect for the wheat crop on this farm was 50 percent better than he had seen it in any season during the fourteen years he had been in charge.

VIRGINIA.

Arlington Farm, Rosslyn. (William C. Eldridge). On May 31 very good yields of both wheat and rye were in prospect. No rust of any kind had developed.

Barleys were ripening. A great deal of the barley winterkilled. The Tennessee Winter variety was the most hardy of the lot.

Fulghum, Aurora, and other early varieties of oats in both nursery and field plats were beginning to ripen. The later-maturing varieties such as Winter Turf, Culberson, etc., were advancing rapidly and looking promising. In fact, owing to better stands, these varieties will again decidedly outyield the early sorts. The nursery was badly infested with weeds, particularly field camomile, Anthemis arvensis, This weed was removed by hoeing early in May but has made a vigorous second growth and doubtless will seriously impair the efficiency of the nursery.

NEW YORK.

Cornell Experiment Station, Ithaca. (W.T.Craig). The rod row seeding of oats at the experiment station and also the seeding of cooperative oat plats in different parts of the state was under way on May 3. All oat hybrids had been sown in the plant-breeding garden as well as part of the barley hybrids. Wet weather had somewhat interfered with the spring work.

At the end of May small grains at the Cornell Station were well advanced for this season of the year. Spring wheat, oats and barley were in excellent condition. Winter wheat looked much better than it did earlier in the season and was beginning to head. The prevailing frequent showers and warm weather are favorable to all crops.

MISSOURI.

State Experiment Station, Columbia. (No report).

IOWA.

State Experiment Station, Ames. (No report).

GREAT PLAINS AREA.

TEXAS.

Amarillo Cereal Field Station, Amarillo. (John F. Ross). The total precipitation for the month of May was 2.39 inches. This was considerably below normal and most of it came during the last week. The mean average temperature, the hourly wind velocity, and the evaporation were considerably above normal.

Corn was planted on the Dry Land Agriculture plats on May 1. The early date-sowings of grain sorghums and broomcorn were made May 11. The sowing of the varietal plats of grain sorghums was started June 1. The soil was wet about 8 inches down, which should insure good germination and rapid growth.

A new kitchen, bathroom and back porch are being added to the teamster's cottage. The roof of the machine shed is receiving a new covering of Certainteed roofing.

Because of the drought, crops made practically no growth during May. Pastures were brown and cattle were being shipped out in large numbers on account of lack of pasture. During the last week in May, however, the drought was broken over a large part of the Panhandle district, and the sowing of grain sorghums was in full strength. The soil was in fine condition for seeding the row crops and people were getting into the fields as fast as possible.

During the week ending May 18, an auto trip was made through Potter, Oldham, Deaf Smith, Castro, Swisher, Hale, Floyd and Randall counties. The grass in Castro and part of Swisher and Hale counties was green but in the remainder of the area covered in this trip the grass was brown. Less than 500 acres of winter wheat that would make a crop were seen. A few irrigated farms around Hereford and Plainview were making a fairly good showing, especially with alfalfa.

OKLAHOMA.

Woodward Field Station, Woodward. (J.B.Sieglinger). Station work has been hampered by weather conditions. Until May 27 the ground was too dry to do much seeding and since then it has been too wet. A hail storm occurred on May 11 and showers on May 14, 25 and 26. A total of 2.89 inches of rain fell from the night of the 27th to the 29th. This was the first good rain in this part of the country since last August.

On May 14 the varietal plats of grain and forage sorghums, also the plats in the third date-of-seeding were sown. The sowing of the broomcorn nursery and varietal experiments was delayed by dry weather until May 27. The milo and kafir rate-of-seeding and spacing experiments also were sown on May 27. There are yet to seed the plats in the broomcorn rate-and spacing experiments and date-of-harvesting experiments. On May 20 the kaoliangs and milos emerged with good stands and the other varieties on May 21.

The rains came in time to save most of the winter wheat though spots in the sandier sections were burnt beyond recovery. There will be more than an average wheat crop for this county in spite of that which was winterkilled and blown out.

KANSAS.

Fort Hays Branch Station, Hays. (F. A. Kiene, Jr.) A dashing rain fell on May 8. This was followed by two weeks of dry weather during which high winds prevailed. A general rain fell on May 21. The remaining days of the month were cloudy with intermittent rains totaling at Hays 3.52 inches. The total rainfall for the month of May was 4.79 inches. This is 1.51 inches more than normal. A temperature of 30 degrees was recorded on May 30, but there was no killing frost.

On May 21 the early date sowings of the grain sorghums were resown the second time. The previous sowings had been buried by blowing soil. Owing to the continued rainy weather, however, these plats will not make stands. Corn on the bottom lands will make fair stands and where the ground was well worked weeds will not be a serious menace for some time. On May 31 the first crop of alfalfa was nearly ready for cutting and on the Station will make about one ton per acre.

The rain came in time to save the wheat in Western Kansas with minor damage. The thick heavy wheat had begun to dry up, especially in spots where least favorable soil conditions existed. All of the wheat had fired to a considerable extent and in many places the estimate of damage was placed at 5 bushels per acre.

Rooks, Rush, Barton and Rice counties were reported as suffering intensely. The wheat in the vicinity of Hays has recuperated rapidly from the effects of the drought and indicates not less than 90 percent of normal condition. On May 31 the wheat at the Station was about 50 percent headed. Winter rye was fully headed on May 15 and this crop has suffered in the wind and drought. Half of the heads seem blighted.

COLORADO.

Akron Experiment Farm, Akron. (F.A.Coffman). Weather conditions have been unfavorable for winter grains in Eastern Colorado during the month of May. No precipitation large enough to be of value was recorded at the Field Station before May 27. The temperatures through the month were high and as a result many fields of winter wheat were damaged by scorching. The burning was more severe in those fields which had been cropped continuously to wheat for several seasons than in fields on corn stubble, fallow or breaking. This condition was especially noticeable in those fields continuously cropped to wheat and given no preparation other than discing. Had it not been for the cool weather and a precipitation of about 1.5 inches during the last week of the month, the loss in many fields in this section would have been nearly complete.

The total precipitation at Akron in May was 1.76 inches. The maximum temperature of 86° was recorded May 9, 16 and 24. The minimum temperature of 29° was recorded May 10. The greatest precipitation, .86-inch, was recorded May 30

On May 31, the condition of all cereal crops, both winter and spring, was about normal. The winter grains had largely recovered from the effects of the dry weather; spring wheat was in excellent condition and above normal, and the prospects for both oats and barley were above normal. Much corn was planted during the first half of May. On account of the prolonged dry weather the germination of the corn which had been planted during the middle of the month was considerably retarded. On May 31, however, much of the corn was above ground.

The cereal crops at the Station are in good condition. Very little burning was noticed in any of the plats. Winter rye started to head on May 20 and by May 31 was almost fully headed. Nebraska Hybrid No. 28 wheat started to head on May 25. The stands in all plats of spring wheat are excellent. There is some danger that the spring wheat is too thick should the season be dry. On May 22 ten varieties of millet and proso were sown in duplicate twenty-fifth-acre plats. These had not yet emerged on May 31.

WYOMING.

Cheyenne Experiment Farm, Archer. On May 4 Mr. Florell reported: "The winter wheat on fallow is yet in better condition than that in stubble, although the latter is showing marked improvement. Winter wheat in furrows did not survive the winter better than that sown on the surface. The ridges (on an area of two tenth-acres) were quite thoroughly leveled by wind action. Field rye is in poor to fair condition. That sown on fallow shows a survival of about 65 percent, while it will be necessary to resow parts of that on corn stubble.

Before leaving for Chico, Cal., he reported on May 11 that the Station work was well along although the season was rather late. Practically all cereal grains in field plats, including flax, had been sown. The first series of plats of spring grains in the date-of-seeding experiment were sown on May 1. Arrangements had been made to seed the nursery grains as soon as the weather permitted. Barley and oats in the varietal and rate-of-seeding experiments were sown on May 2. Varieties of spring common and durum wheats and the rate-of-seeding experiments with durum wheat and spring emmer were sown on May 4.

In early May much raw land in the Cheyenne district was being broken and seeded to wheat. Spring wheat is growing in favor. This is especially true of durum wheat, although Marquis wheat is being grown to some extent. In the fall, seed stocks for spring sowing on the farms and at the local elevators were thought to be ample for local needs but since a considerable acreage of winter wheat had to be resown there is a scarcity of spring wheat.

SOUTH DAKOTA.

Crop conditions are promising throughout the state, with only one exception. The winter rye is backward and uneven and is headed unusually short, possibly due to the long drought last year with exceedingly dry weather last fall and early this spring. Questions are being received regarding the advisability of plowing up this short rye and planting to corn or proso or flax. Such inquirers have been advised to leave their rye, in the belief that it will make at least ten bushels per acre.

Brookings Experiment Station, Brookings. (Prof. Manley Champlin). On May 15 seeding had been completed except flax and proso. Winter wheat from Nebraska and Kansas was almost entirely winterkilled. Turkey, S.D.144, wintered with a stand of from 80 to 100 percent. The more thickly the plats were seeded the better the survival. At the end of the month all cereals including corn were in excellent condition. Plentiful rains have made the prospect promising. Corn was planted just in time to receive the benefit of the rain.

Cottonwood Substation. The spring cereals are in good condition. Moisture conditions are unusually favorable. On May 31 corn planting was nearly completed. Sweet clover and alfalfa wintered in good shape and were making good growth.

Eureka Substation. Owing to the extreme drought conditions that prevailed during the past twelve months the alfalfa of all varieties died, including that in the cultivated rows, excepting in the low places where all varieties were about equally good. The loss of the winter grain from winterkilling or drought was complete, except rye on summer fallow. Even this had a poor stand. Fall seeding of spring cereals was not a success. Spring cereals were seeded early and at the end of May were in good condition with a stand of 100 percent.

Highmore Substation. All cereals are in good condition. In the absence of Mr. McFadden, Mr. George Janssen proceeded to Highmore on May 8 to stake out the cereal nursery and take notes on emergence of spring grains, stand, etc. On May 30 the planting of corn was nearly completed. Corn breeding is deferred this season owing to shortage of technical assistance.

Vivian Substation reports on May 30 that corn planting is nearly completed. Some alfalfa winterkilled. Oats and rye are in good condition.

NORTH DAKOTA.

Northern Great Plains Field Station, Mandan. (J.C.Brinsmade, Jr.) Growing conditions have been ideal during the month of May. A fall of .76 of an inch of rain on May 31 brings the total precipitation for the month to 2.45, just .01 more than the 40-year average for the month. The rains during the month generally have been long continued so that most of the moisture has had a chance to soak in, and there has been so much cloudy weather that evaporation has been very low.

Small grains were frozen badly on May 12, when the temperature was 23°, but quickly recovered. Temperatures below freezing were recorded also on May 13, 17 and 20, but no injury was noted on those dates.

Spring-sown small grains were about 6 inches high on May 31 and looking very well; the winter rye heading; and flax looking very well except that in a few low spots stands had been somewhat cut down by frost.

Dickinson Substation. (Ralph W. Smith) The month of May in general has been cold, dry and windy. The precipitation up to May 29 was 1.67 inches. Practically all the rainfall occurred

during the latter part of the month, one inch falling in the storm of snow and rain on May 25 and 26. The freezing temperatures occuring just after the middle of the month, followed by severe winds, caused some injury to oats and barley that had recently emerged. Early sown wheat, oats and barley suffered very little from the effects of the frost, and the rains during the latter part of the month promised to cause a rapid recovery of the injured grain.

At the Station, seeding of the wheat varieties in the nursery was finished April 29, and of oat and barley varieties on May 4. On May 11 the grain sown in April had germinated with fairly good stands and the grain sown May 1 was emerging. On May 29 the sowing of the spring cereals had been completed, except prosos, grain sorghums and flax varieties. Cereal crops at the Station are in good condition except one field of increase wheat that was injured by the drifting of the soil. The frost did scarcely any damage.

A large acreage of spring wheat has been sown in the district and a considerable area of flax has been sown on breaking. While the acreage of corn may be less than usual, some large fields have been planted. Corn has been slow in germinating, due to the cold weather.

Williston Substation, Williston. (Vacant). No report.

MONTANA.

Judith Basin Substation, Moccasin. (Report from P. V. Cardon, Office of Dry Land Agriculture). There has been a good deal of cold weather during May and crops have made slow growth. The precipitation for the month was 2.69 inches.

Winter wheats on the Station suffered considerable winterkilling. Winter rye, on the other hand, came through in splendid condition.

At the end of May all of the spring cereals were up to good stands and growing well. Rabbits were doing a little damage but they were being eliminated as rapidly as possible.

The increase fields of spring cereals comprise about 30 acres each of Marquis wheat, White Smyrna barley and Sixty Day oats, about 7 acres of Pelissier wheat, and 3 or 4 acres of flax (C.I.No.19). These came up with good stands and are growing well.

WESTERN BASIN AND COAST AREAS.

UTAH.

Nephi Substation, Nephi. (Aaron F. Bracken)
During the first week in May all corn was seeded at the Station and half the soil sampling was done. The fencing of a small pasture for the horses was completed. A car is used now in traveling to and from the Station, which saves much time in transit and will add at least one-half hour per day on Station work where teams are used.

During the week of May 5 there was a rainfall of .96 of an inch, which greatly improved the condition of the crops. Previous to the rain the potato varieties were planted, also two tenth-acre plats in the rotation work. Soil samples from 22 plats were taken for soil moisture study. Plowing was also continued.

On May 23 crops on the Station were looking better than had been expected. The thin stands were stooling so much that the ground was almost covered.

IDAHO.

Aberdeen Substation, Aberdeen. (L. C. Aicher)
This has been the coldest May since the Station was established. The average daily minimum temperature for May was 6.2 degrees below all previous records. The precipitation for May was 1.10 inches below the normal of 1.54 inches.

All the nursery seeding was completed April 30. Barley, wheat, and oat nurseries are in good condition but not growing much. Neither are the weeds. Crops are growing very slowly and dry-land crops are needing rain. The first cutting of hay promises to be considerably below normal because of the cold weather. The irrigation season began much earlier than usual, due to the dry weather. On May 13 all the canals were running at about two-thirds capacity, an unusual condition for that time of the year. At the end of May irrigation of grain was in full flow. In many instances the grain was being irrigated to bring it up, the ground being too dry to sprout it.

The lack of precipitation and the low temperatures in this section of the State have caused a great deal of damage to the crops. Peas and small grains have been frozen severely. A heavy frost (23 degrees) on the night of May 11, following two small showers, did untold damage

to the sugarbeet crop. In some cases sugar beets are being replanted for the third time.

Poisoning of ground squirrels has been done on a large scale. Several hundred ounces of strychnine alkaloid have been sold by the County Agent in Bingham County. Most of this was mixed by the County Agent, the U. S. Biological Survey formula being used. Thousands of dollars worth of wheat will be saved through this agency alone.

OREGON.

Harney Branch Station, Burns. (John H. Martin) Freezing temperatures occurred on 17 days during May. The minimum temperature for the month was 12°, and the maximum 84°. The total precipitation was .26 of an inch.

Grain and alfalfa were slightly injured by freezing and are making very little growth. Crops prospects are not very promising on account of the unusually dry season.

Grasshoppers are doing considerable damage to alfalfa in various parts of the Harney Valley. The Department of Agriculture has detailed a specialist to lead the campaign of extermination. Efforts at poisoning the grasshoppers have not been very successful as yet, owing to the unfavorable weather for feeding. The business men of Burns and most of the farmers in the vicinity are assisting in the spreading of poisoned bran mash on the infested areas.

Sherman County Branch Station, Moro. (D. E. Stephens) Abnormally low temperatures prevailed during May. The highest temperature recorded was 81°, on May 2; the lowest 31° on May 20. The total precipitation in the month was .88 of an inch, which is .38 of an inch less than the normal for May. The total precipitation in the months of March, April, and May was 1.64 inches, or 1.13 inches less than normal. The wind velocity for the month has been high, the average hourly velocity for the month being 9.7 miles. The evaporation was also higher than normal, the total for the month being 7.04 inches.

At the end of May winter grains throughout the County were in good condition, though thickly planted grain on shallow ground was beginning to burn. Winter wheat was beginning to head and was in need of moisture. Due to the cold weather, spring-sown grains were making very slow growth. The early-sown spring grains had the thickest stands and were in much better condition than grains sown later in the spring.

WASHINGTON.

Adams Branch Experiment Station, Lind. (M.A.McCall) On May 8 the dry spell of two months was broken by a slight rain amounting to .10 of an inch. On the night of May 9 there was a hard freeze, not to the extent of injuring the wheat, however. On May 17, .35 of an inch of rain fell. During the latter part of the month winds were frequent. The rainfall for the month was less than one-half inch and temperatures have been low.

Moisture and nitrate determinations on tillage plats were made at the Station the first week in May. In general, moisture differences were not very noticeable under different methods of tillage, due to the fact that last year practically all of the rains came rather late in the season, putting the late plowing at an equal advantage with the early. Stand counts were made on all plats and plat alleys at the end of May, and the weeds cleaned out of winter grains. In spite of the fact that the winter grains were seeded before any rain of consequence came in the fall, there is very little mustard appearing this season, in marked contrast to former experiences.

Crops on the Station are doing only fairly well. Field peas seem to be suffering from drouth, the leaves turning brown and color poor. The reason for this is not apparent as there seems to be plenty of moisture in the soil and innoculation was perfect. It may be due to the almost constant winds. Stands in cereal varietal experiments are a little too thick, due to seeding at a heavier rate than commonly the case, in the expectation that wire worms probably would thin the grain. This particular part of the farm, however, escaped the worms and as a result the grain is now too thick. At the end of May, spring rye had headed and was in blossom; winter wheats were beginning to head; and spring varieties were in the boot stage.

A visit from President Holland of the State College and Director Severance of the Experiment Station was expected on June 8.

Crop conditions in this immediate section of the State are rather below the average. Soil blowing has done a great deal of damage. On May 24-25 a two-day trip was taken with Professor Sievers of the Soils Department at the State College, in which the soil-drifting sections of Adams and Franklin counties were visited. Damage varied considerably in different parts of the territory, being probably most severe west of Cunningham in Adams County. A great many fields were observed which were practically blown out or at least blown to a point where the recovery of the wheat

was extremely doubtful. In others only a small part of the seed was lost. The problem seems to be a community one, as the good farmer who handles his soil in a proper manner if often the victim of his neighbors' carelessness.

CALIFORNIA.

Plant Introduction Garden, Chico. (Victor H.Florell) Nursery and field barleys were fully ripe shortly after May 20. Their harvesting has been completed. Many varieties were lodged badly, causing considerable difficulty in harvesting operations. Comparatively few varieties were only slightly lodged.

On May 30 wheats were ripening rapidly. A number of field plats had been harvested and it was expected that all wheats in field plats would be ripe about June 5. Many of the nursery rows were beginning to ripen. The flax varieties in the nursery were also ripening rapidly and uniformly.

A large number of varieties in both nursery and field plats have lodged badly, in many cases being almost entirely flat on the ground. There is a serious infection of bunt in several of the field plat varieties. Infection is most severe in the varieties whose source has been the Northern Pacific Coast States.

Rice Field Station, Biggs. (J. W. Jones)
The weather up to May 31 was cool, and therefore the germination and growth of rice has been rather slow. It was too early to estimate stands as only part of the rice sown had emerged.

A meeting of rice growers was held at Willows on June 1, to discuss means of checking and eradicating water grass.

Good yields were expected from barley and wheat in the district. Barley was practically all ripe and harvesting had started. Wheat was ripening fast.

The Dodge Land Company has planted about 1200 acres of cotton on old rice land a few miles west of Durham.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10. June 20, 1918. No.6

Project Issue: Cereal Diseases.

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OFFICE ACTIVITIES.

PERSONNEL

C. H. Clark returned to the office Tuesday morning, June 18. In cooperation with the Seed Stocks Committee, he conducted a campaign for increased flax acreage during April and May, with headquarters in Minneapolis. On May 16 Mr. Clark left for the southwestern United States, visiting the flax experiments at Bard, Chula Vista, and Davis, Cal., and Tempe and Sacaton, Ariz., and consulting with experiment station officers at Tucson, Ariz., Berkeley, Cal., and Corvallis, Oreg. On his return trip he visited the experiment stations at Mandan and Fargo, N.Dak., and St. Paul, Minn. He leaves Washington tonight on a trip to New York City and Ithaca, N.Y., to consult with linseed oil crushers and station officials at Ithaca conducting cooperative flax work. Thereafter he will be on leave for several days at Skaneateles, N.Y.

A. A. Potter, assistant pathologist in cereal smut investigations, left Washington on June 18 to visit the Michigan Experiment Station in connection with smut experiments conducted there. En route he will attend the annual Cereal Disease conference at Purdue University, Lafayette, Ind.

Dr. R. D. Rands, in charge of the investigation of wheat scab, left Washington on June 18 for a field trip in the northcentral States in connection with his study of the scab disease of cereals. En route he will attend the annual Cereal Disease conference at Lafayette, Ind.

Charles S. Reddy, in charge of the Smut-Control campaign in the Great Plains States, has been in the Washington office since June 1. He left Washington on June 18 for Kansas and Nebraska to resume his work. En route he will attend the annual Cereal Disease conference at Lafayette, Ind.

Dr. W. H. Tisdale, in charge of investigations of Physoderma disease of corn, has been in the Gulf and South Atlantic States since May 25, making field observations on the occurrence of this disease. He reports that thus far there has been very little infection in this year's crop.

VISITORS.

Prof. O. D. Center, Director of Extension in Oregon, was an office visitor on June 13, to discuss locating a supply of suitable seed of the best cereal varieties, through a cooperative field survey.

Prof. F. S. Cooley, Director of Extension in Montana, visited the office on June 11, to confer on prospective cooperative work in making a field survey to locate a suitable seed supply of certain cereal varieties.

Sergt. A. D. Ellison, formerly in charge of the experimental work with cereals at Arlington Farm, who enlisted in the Gas Defense Service in October, 1917, was an office visitor on June 20. Sergt. Ellison is giving gas defense instruction at Camp Humphreys, Va.

Prof. L. W. Flaharty, Director of Extension in Idaho, visited the office on June 11, to discuss prospective cooperation in locating a suitable seed supply of certain cereal varieties, through a field survey.

Prof. E. C. Johnson, Director of Extension in Kansas, visited the office on June 14, to confer on possible cooperation in field surveys to locate suitable seed of desirable varieties.

MEETINGS.

The annual Cereal Disease conference was held at Purdue University, West Lafayette, Ind., June 19-21, inclusive, Owing to the necessity of maintaining our Smut-Control and Barberry Eradication campaigns at steady pressure, only a very few members of the staff were authorized to attend this meeting

The Pathologists' War Board will be in conference at Wisconsin University, Madison, Wisc., June 22-24, inclusive. Dr. Stakman, leader of the Barberry Eradication campaign, is a member of the Board and will be present at the meeting. Dr. Humphrey also will attend for the purpose of conference with pathologists.

The annual convention of American Nurserymen will be held at Chicago on June 26. Dr. Stakman, Dr. Melhus of Iowa, and Mr. O'Brien will be present to give information on the danger to wheat from rust-infected barberry plants. It is hoped that the nurserymen will discontinue the sale of the common barberry as an ornamental plant in the central United States.

The annual conference of Western Agronomists is to be held at the Oregon Agricultural College and Experiment Station, Corvallis, this year. The date of the meeting has not yet been fixed but probably it will occur some time in July when the condition of crops under experiment at Corvallis will be most attractive to the visiting agronomists. It is hoped that all members of the field station staff of this office west of the Rocky Mountains will be able to attend this meeting. The continued delay in the passage of the Agricultural Appropriation Bill may seriously interfere with the use of funds for traveling expenses in July.

CEREAL INVESTIGATION PROJECTS.

The beginning of the discussion of the projects of the Office of Cereal Investigations was made in the issue of the Courier for May 20. It was possible in that issue to complete only the agronomic projects, excepting No.217: Cereal Tillage and Rotation Investigations. That also is omitted from this issue, which will be confined wholly to the presentation of the Cereal Disease project and subprojects.

218. CEREAL DISEASE INVESTIGATIONS.

The Cereal Disease work as heretofore organized comprises a single project, No.218, divided into four subprojects as follows:

Summary of Subprojects and Included Problems.

218-A. Investigations of Miscellaneous Cereal and Flax Diseases.
218-B. Investigations of Cereal Rusts:
1. Leaf Rusts,
2. Black (Stem) Rust and Stripe Rust.
218-C. Investigations of Fungous and Non-parasitic Diseases of Corn, Grain Sorghums, and Broomcorn (except rusts and smuts).
218-D. Investigations of Cereal Smuts.

In addition to these four subprojects the following emergency work is being conducted:

A. Campaign for Barberry Education and Eradication.
B. Control of Cereal Smuts and other Cereal Diseases by Seed Treatment.
C. Investigations of Thrasher Explosions and Fires.

Of these, (A) is an extension of subproject No.218-B2, while (B) and (C) are extensions of subproject No.218-D. In the discussion of the scope and progress of the work, these Emergency subprojects will be considered with the regular subprojects to which they relate, as indicated above.

The cereal disease problems now under investigation or awaiting study, grouped by subprojects, are as follows:

218-A. Investigations of Miscellaneous Cereal and Flax Diseases.

(1) Diseases of flax (wilt, canker, etc.)
(2) Scab of wheat, oats, barley, and rye.
(3) Oat blast.
(4) Helminthosporium diseases of barley.
(5) Diseases of rice (straighthead, rotten-neck, etc.)
(6) "Wheat sick soil" problem.

218-B. Investigations of Cereal Rusts.

(7) Stem rust of wheat, oats, barley, and rye, in all its aspects.
(8) Campaign of Education for the eradication of the barberry.
(9) Stripe rust of wheat, barley, and rye, and related grasses.
(10) Leaf rusts of wheat, barley, rye, and corn.

218-C. Investigations of Fungous and Non-parasitic Diseases of Corn, Grain Sorghums, and Broomcorn (except rusts and smuts)

(11) Physoderma disease of corn.
(12) Corn root, stalk, and ear rots.
(13) Downy mildews of corn and allied crops.
(14) Ergot disease of small grains and related grasses (projected).

218-D. Investigations of Cereal Smuts.

(15) Smuts of corn, sorghum, and broomcorn.
(16) Bunt, or stinking smut, its distribution, ecology, physiology of infection, and control.
(17) Seed treatment in the control of the smuts of oats, barley, and rye, with special reference to seed injury.
(18) Nation-wide cooperative campaign for the control of smuts of wheat, oats, barley, rye, sorghum, and broomcorn.
(19) Control of thrasher smut explosions and fires.

Appropriations.

The appropriation bills, and funds for (or alloted to) cereal disease investigations in the fiscal year 1918, just ending, and the fiscal year 1919, about to begin, are given below.

Agricultural Appropriation Act, 1917-18.

General Cereal Disease Investigations.	$26,700	
Black Rust and Stripe Rust Investigations	20,000	$46,700

Food Production Act, 1917-18, (Allotments from)

Smut-Control Campaign	$100,500		
Barberry Education and Eradication ...	29,500	130,000	$176,700

The pending appropriations on the basis of which plans for the work of next fiscal year have been made are as follows:

Agricultural Appropriation Bill, 1918-19.

General Cereal Disease Investigations.	$26,700	
Special Corn Disease Investigations ..	25,000	
Black Rust and Stripe Rust Investigations	100,000	
Barberry Education and Eradication Campaign	150,000	$301,700

Food Production Bill, 1918-19.

Cereal Smut-Control Campaign	$110,000		
Thrasher (Smut) Explosion and Fires ..	10,000	120,000	$421,700

The item in the Agricultural Appropriation Bill providing $150,000 for the barberry education and eradication campaign makes the fund available immediately on the passage of the bill. However, at date of issue (June 20) the bill has not been passed by Congress and no money is likely to be available during this fiscal year ending June 30.

PERSONNEL.

The present staff of Cereal Disease Investigations consists of 18 men engaged in the regular investigational work, 10 of whom devote full time to research. In addition to the regular staff there is a temporary force of about 100 field assistants engaged in the Smut-Control campaign and the work of Barberry Education and Eradication. The clerical staff consists of three clerks and one messenger.

218-A. INVESTIGATIONS OF MISCELLANEOUS CEREAL AND FLAX DISEASE.

Experiments are being conducted at various field stations to determine the prevalence, economic importance and life histories of the imperfect and other fungi producing disease in rice, wheat, and other cereal crops, and in flax, and to devise methods of control, devoting particular attention to wheat scab.

Field, greenhouse, and laboratory experiments are being conducted to study the physiology, life history, and control of the rice-blast organism, Piricularia grisea, and several other organisms which are related to seedling blights, leaf diseases, and possibly to straight-head of rice. Two species of Fusarium found quite frequently in diseased rice plants have been isolated and studied and further data on the physiology of Piricularia grisea accumulated. The relation of different organisms to seedling blights has been established. The organism causing a very common leaf disease has been isolated, and studies in its life history are being made. Comprehensive experiments on the relation of cultural treatments to the probable causes of straight-head are under way and considerable data have been accumulated.

In cooperation with the Wisconsin Agricultural Experiment Station, studies are in progress on the Helminthosporium diseases of barley. These studies cover the life histories and habits of the several organisms, the distribution and economic importance of each of the three diseases, the relation of the causative organisms to other cereals and to wild and cultivated grasses, and methods of control by means of formaldehyde and other fungicides. Some results are in preparation for publication. Experimental evidence showing the susceptibility of wheat and oats to infection has been obtained, and species of Helminthosporium and Fusarium have been isolated from diseased plants received from different parts of the country. Stripe disease of barley is found to be largely preventable by formaldehyde treatment.

Field and laboratory studies in flax are being conducted to determine the cause of flax canker and to determine facts relative to the physiology and etiology of flax wilt. Besides Fusarium lini, causing flax wilt, other organisms have been isolated which are parasitic on flax. A species of Rhabdospora has been found to produce a disease somewhat similar to flax wilt, but which kills the wilt-resistant as readily as it does the more susceptible varieties. A species of Colletotrichum has been isolated which will kill flax but its relation to flax canker has not as yet been definitely established. More work on resistant varieties and other control measures is projected.

218-B. INVESTIGATIONS OF CEREAL RUSTS.

Leaf Rusts. In cooperation with the Iowa State Experiment Station, an exhaustive study of crown rust of oats is in progress. The work is being conducted with a view to determining facts concerning varietal susceptibility to crown rust; physiology of infection; biologic forms; overwintering; ecology; and rust resistance. The study of leaf rusts of wheat, barley, rye, and maize, has been undertaken recently in cooperation with the Purdue University (Indiana) Experiment Station. This work as projected will be conducted along lines similar to those followed in the study of the other rusts.

Black (Stem) Rust. Greenhouse and nursery cultures of a number of varieties of wheat and other small grains are being conducted in the State Experiment Stations of Minnesota, Kansas, Tennessee, and Iowa, to determine the relative rust-resistance of each and the relation of growth factors to infection. Breeding experiments for the purpose of producing rust-resistant varieties also are in progress.

Extensive hybridization and selection experiments are in progress at St. Paul, Minn. Rust-resistant durum wheats and other resistant varieties are being crossed on varieties noted chiefly for their milling and bread-making qualities in order to obtain rust-resistant strains of good milling quality. Extensive milling and baking experiments have been made with a number of rust-resistant hybrids. The physiology and chemistry of infection are studied to obtain more data on the physiological behavior of host plants and of host tissues when subject to invasion by the rust organism. More precise knowledge of the relation of growth factors will be obtained through the use of the more refined methods of recording relative humidity, evaporation, soil and atmospheric temperatures, wind movements, etc.

Considerable work has been done relative to the influence of meteorological factors on the development of rust epidemics.

These investigations have been greatly increased and the following additional work has been undertaken: An exhaustive study of the rust-in-seed problem; extensive field observations and studies in North Dakota, South Dakota, Minnesota, Kansas, and wheat-producing sections elsewhere in the United States; a continuation of studies on the relationships of the rusts of grasses to cereal crops, and vice versa; and further studies on the cytology of infection.

Department Bulletin No.629, entitled "Greenhouse Experiments on the Rust Resistance of Oat Varieties" was published in February, 1918. Additional data on the question of rust-resistant varieties is now in manuscript and soon will be submitted for publication as a Department bulletin.

Barberry Education and Eradication. The relation of the common barberry, Berberis vulgaris, to the development of black or stem rust in wheat, oats, barley, and rye, has long been recognized. In certain European countries it has been demonstrated that the eradication of the barberry has resulted in a marked decrease in the amount of damage caused by stem rusts. The enormous losses caused by stem rust in this country have emphasized the importance of our undertaking a widespread campaign of education for the eradication of the barberry.

In March of the present year an extensive campaign against barberry was undertaken in the following States: Colorado, Illinois, Iowa, Indiana, Michigan, Minnesota, Montana, Nebraska, Ohio, South Dakota, Wisconsin, and Wyoming. In North Dakota it already was proscribed by State law. In cooperation with the States Relations Service, a large number of field assistants, working through State leaders, county agents, and other available agencies in the various States, give information on the relation between the common barberry and the stem rust of wheat, oats, barley, rye, and grasses. This is done by verbal instruction, circular letters, circulars, posters, newspaper articles, and all other available means, to farmers, townspeople, nurserymen, landscape gardeners, park boards, schools, boys' and girls' clubs, boy scouts, State and county councils of defense, and other available agencies, for the purpose of encouraging the removal and destruction of the barberry bushes. The assistants also make a survey to determine the distribution of the rust-bearing varieties of barberry and the amount of rust on these bushes and on nearby grains and grasses. This information is taken on uniform blanks and sent to the State leaders and also to the leader in

charge of all of the work.

The results already obtained have been very gratifying. Public sentiment in the States named has been aroused. Information has been widely disseminated to schools and the general public. Nurserymen for the most part have agreed to discontinue distributing common barberry bushes. The park boards in many of the large cities have decided to eradicate the common barberry. The State nursery inspectors or State entomologists have declared their intention of destroying common barberry bushes wherever found infected within their respective States. Several State councils of defense have issued appeals for the eradication of the common barberry. As a result of the campaign, the Public Safety Commission of Minnesota has issued an order providing for the compulsory eradication of common barberry from the State. A law providing for barberry eradication has been in the statute books of North Dakota for over a year.

Stripe Rust. In 1915, there was discovered in Arizona and elsewhere in the States west of the Rockies, a rust which, according to information then obtainable, was new to the United States. The rust in question was the yellow or stripe rust, so common and so destructive in Europe. An investigation of the herbarium material in the various rust herbaria of the United States disclosed that stripe rust had been collected as long ago as 1892, but had been classified under another name. Owing to the notoriety which this rust enjoys in Europe, funds were provided for its investigation and attempted control in this country.

Since June, 1916, cooperative work in the investigation of this rust has been in progress at the Oregon Agricultural Experiment Station, at Corvallis. Field, greenhouse, and laboratory experiments are under way to determine the relation of forms of this rust on wild grass, to wheat, barley, and rye; relation of infected seed to subsequent outbreak of rust; varietal (host) susceptibility; over-wintering; summer desiccation; and relation of meteorologic factors to rust development.

218-C. INVESTIGATION OF FUNGOUS AND NONPARASITIC DISEASES OF CORN, SORGHUM, AND BROOMCORN. (EXCEPT RUSTS AND SMUTS)

An investigation of the smuts of corn and sorghums (including broomcorn) has been in progress for several years. It has long been recognized also that these crops were subject to other diseases of considerable economic importance. As a consequence of the increasing importance of these various corn diseases, funds have been provided for their investigation. Field, laboratory, and greenhouse experiments are now in progress to determine the facts concerning the life histories and physiological behavior of hosts to parasites and vice versa. The more important groups are discussed below.

Experimental work conducted by Mr. J. R. Holbert, of the Funk Seed Company, at Bloomington, Ill., during a period of several years, has revealed the fact that the yield and quality of the corn crop are seriously affected by the development of certain rot-diseases induced by fungi infesting the soil and seed. Considerable progress has been made in the study of root and ear rots of corn caused by soil-infesting fungi.

In a number of the southern States, epidemic outbreaks of another disease caused by a species of Physoderma have been reported from time to time. In some instances damage resulting from this disease has amounted to as much as 50 per cent of the crop in the districts from which damage was reported. A cooperative field survey conducted throughout the corn belt showed the Physoderma disease of corn present in 27 States, but of economic significance only in the Gulf and South Atlantic Coast States. Life-history studies are well advanced.

Very destructive diseases of corn, induced by certain of the downy mildews, occur in the Orient. A quarantine prohibiting the importation into this country of shipments of corn from the Orient was established in 1916, on this account. In order to obtain information concerning the downy mildews of corn and related crops, and to determine further the facts affecting the possible introduction and establishment of these diseases in the United States, the Department has detailed an investigator to the Orient to conduct a thorough study of these diseases.

218-D. INVESTIGATIONS OF THE CEREAL SMUTS.

Experiments are conducted at the various field stations and in cooperation with the state experiment stations of Kansas, Minnesota and Oregon to determine the physiology, history and distribution of the cereal smuts, to improve present methods of smut control and to devise new ones.

Bunt or Stinking Smut. Field and nursery experiments have been in progress since 1913 and methods of prevention have been worked out. Additional data have been recorded on the influence of soil temperature and soil moisture on the infection of wheat by the stinking-smut organism, on crop rotation as a means of controlling stinking-smut in the Pacific Northwest and on the relation of wind disseminated spores to occurrence of bunt in regions where the biennial cropping system is followed.

The work already done will be supplemented by experiments on a much larger scale involving the use of acreage in several parts of Oregon to determine the length of the rotation period necessary for prevention of bunt in the Pacific Northwest. Further laboratory and field experiments will be conducted to determine accurately the influence of soil moisture and soil temperature on the infection of wheat by the bunt organism, to determine the relation of early and late sowing on infection, to ascertain facts concerning relation of tillage to infection, and to study by chemical analysis the chemistry of infection. Field and nursery experiments will be conducted at Moro, Oregon, to determine best methods of seed treatment of wheat grown in the semi-arid district of the United States.

Loose Smuts of Wheat and Barley. There is now being made a careful experimental study of the process of infection from the loose smuts of wheat and barley. This is necessary to better control of infection in the artificial inoculation of material for microscopic study and that work on the subject of control measures may be facilitated through seed selection. An automatic control of the hot-water treatment at 42° - 50° C. is now being perfected in an effort to make it of practical value. Other methods of prevention also are being studied.

Loose Smut of Rye was discovered in this country in 1913. Stem Smut of Rye is prevalent in the North-Central states and may be prevented by formaldehyde treatment of the seed.

The Loose and Covered Smuts of Oats are being studied in the field and in artificial cultures with a view to a better understanding of their distinctions. The specific distinction between these two smuts of oats has been confirmed. The application of these results to a critical study of the immunity of Burt oats is projected. The immunity of Burt oats has been called in question by the results obtained in 1917.

The Corn Smut organism has been found to occur on the young plants and in the air before the disease appears in the field. Spraying has reduced the amount of smut but this probably is because it also reduced the growth of the plants by the injury it caused. Efforts are being made to avoid this injury.

Resulting from the investigations of the cereal smuts already conducted, methods of prevention of bunt or stinking smut of wheat, covered smut of barley, and oat smut have been worked out, and the annual preventable loss is estimated at 100,000,000 bushels. Farmers' Bulletin No. 939, entitled "Cereal Smuts and the Disinfection of Seed Grain", by Harry B. Humphrey and Alden A. Potter, was issued in April.

Smut-Control Campaign.

The work as planned comprehends the conduct, in cooperation with the States Relations Service, of a campaign for the control of smuts and other preventable cereal diseases. The work was begun last fall and is carried on by a staff of about 40 field assistants assigned to different sections of the United States. They work under the direction of 8 leaders qualified by experience and training to direct this particular type of extension work. These field assistants in conjunction with county agents or other farm advisers, last fall and this spring, conducted seed-treatment demonstrations before farmers' organizations, movable schools, county and township high schools, chambers of commerce, and other state agencies.

The seed-treatment phase of the campaign now is being followed by an extensive and thorough field survey. The purpose of this is to compare the results in fields sown with treated seed with those observed in fields where seed treatment was not practiced. The field assistants also collect information as to distribution of, and losses by preventable cereal diseases; address farmers' organizations; give instructions to individual farmers on methods of seed treatment; conduct field demonstrations illustrating in unorganized sections of the country the value of seed treatment as a means of increasing crop production; and determine what sections of the country are in greatest need of instruction and other assistance in the control of cereal diseases.

The field survey now in progress will be followed again by a fall campaign for seed treatment, in which the results obtained during the field survey will be put into direct use. The major emphasis is being placed upon the treatment of preventable smuts of wheat, oats, barley, rye and grain sorghums.

The campaign for the treatment of seed has been conducted in the following States: New York, Pennsylvania, North Carolina, South Carolina, Georgia, Alabama, Kansas, Kentucky, Ohio, Indiana. Illinois. Wisconsin, Minnesota, Iowa, Missouri, Texas, Oklahoma, Colorado, South Dakota, North Dakota, Montana, Washington, Oregon, and California. The work thus far conducted within these States probably has resulted in the treatment of 50 per cent of all the seed wheat, oats, and barley sown. This means a saving of not less than 10,000,000 bushels of wheat, 25,000,000 bushels of oats, and 4,000,000 bushels of barley

Investigations of Thrasher Explosions and Fires.

For many years it has been known that destructive explosions and fires have been caused by accumulation of dust and the spores of the stinking smut of wheat. In the Pacific-Northwest during the years 1914 and 1915, losses amounting to approximately $1,000,000 were borne by the thrashermen and farmers as a result of smut and dust explosions. Careful investigation as to the cause or causes of these explosions was undertaken in 1914, in cooperation with the Bureau of Markets, Bureau of Chemistry, and the State experiment stations. This investigation has been extended to include experiments with smut-and-dust-collecting devices attached to a number of experimental thrashing machines. Experiments thus far conducted indicate that smut-and-dust-collecting fans have been developed to a point of efficiency amounting to as much as 65 per cent. Work is now under way with a view to improving these fans to a point where they may be able to remove from the thrashing machine fully 85 per cent of all the smut and explosive dust. Thirty-two thrashing machines of various makes, equipped with smut-and-dust-collecting fans are to be distributed through the Pacific Slope States of Washington, Idaho, Oregon, and California; the upper Mississippi Valley: Minnesota, North Dakota, South Dakota, and Wisconsin; the Southern Great Plains area: Texas, Oklahoma, Colorado, and Kansas, and in the Northeastern section which includes Michigan, New York, Ohio, and Pennsylvania. These machines, in addition to the fan equipment, are wired in accordance with the latest approved methods in order to conduct static electricity from the machine to the ground and thus to prevent ignition of smut and other combustible dust during the progress of thrashing. Special smut traps operated by pathological field assistants are used in collecting smut from the machine with the fan in or out of operation. Laboratory assistants make daily analyses of these smut collections and calculate the percentage of fan efficiency. Pathological field assistants will at the same time determine the most effective method of destroying spores collected by

fan equipment, making tests of viability of smut spores subjected to live steam or other treatment at the time of collection by machine. Satisfactory methods of destruction of spores collected by machines havennot yet been worked out. Work thus far accomplished has shown conclusively that fans of high efficiency play an important part in the prevention of wind dissemination of spores and thereby appreciably diminish the percentage of infection caused by spores present in the soil. In addition to this, the cleaning process to which the wheat is thus subjected results in an increase of from one to ten cents per bushel in the market value of the grain.

It should be noted that in no case where fan and wiring equipment has been installed has there occurred a single explosion or fire.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10. June 30, 1918. No. 7.
Miscellaneous Issue.

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OFFICE ACTIVITIES.

PERSONNEL.

Charles E. Chambliss left Washington on June 22 for Porto Rico where he will spend several weeks giving expert assistance in the development of the rice industry, the work to be done in cooperation with the Porto Rico Experiment Station.

Dr. H. V. Harlan left Washington on June 26 for points in the West. He will inspect the barley experiments at Lincoln, Nebr., and Manhattan and Colby, Kans., and will conduct physiological and breeding experiments in the barley nurseries at Aberdeen, Idaho.

Dr. H. B. Humphrey attended the meeting of the War Emergency Board of American Plant Pathologists held at Madison, Wisc., June 22-24.

Walter K. Noe, who has been in the clerical staff of the office since May 3, returned to his home in Cincinnati on June 21 to take up work with the Baltimore & Ohio Railway Company, where he was previously employed. Mr. Noe could not find suitable accommodations for his family here due to the congestion of the city.

Merritt N. Pope, whose appointment was previously mentioned, reported at St. Paul on June 15 to take care of the cooperative breeding work in barley at the University. He later met Dr. Harlan in Kansas and accompanied him to Aberdeen, Idaho.

B. E. Rothgeb returned on June 30 from a six-weeks' visit to the southwestern States, including the Imperial Valley and other parts of California, in the interests of grain-sorghum investigations. He reports that there are prospects of a large acreage of grain sorghums in Kansas, Oklahoma, and Texas. The grain sorghum acreage in New Mexico will be seriously affected by the prolonged drought.

Dr.E. C. Stakman, in charge of the campaign for the eradication of the common barberry, arrived in Washington on June 28 for the purpose of conference regarding his work in the new fiscal year.

Dr. W. H. Tisdale left Washington on June 29 for a trip to North and South Carolina for the purpose of carrying on his investigation of the Physoderma disease of corn.

VISITORS.

Professor J. F. Duggar, Director of Extension at the Alabama Agricultural College and of the Alabama Agricultural Experiment Station, was an office visitor on June 22 for conference on the matter of obtaining suitable seed supplies for that State, through field inspection.

Professor W. S. Thornber, Director of Extension at the Washington State College, visited the office on June 26. The subject of field inspection of wheat and other cereals was discussed, with a view to obtaining suitable supplies of seed grain.

PUBLICATIONS.

Farmers' Bulletin No. 958, entitled "Standard Broom Corn," by Benton E. Rothgeb, was received for distribution on June 17.

Farmers' Bulletin No. 968, entitled "The Cultivation and Utilization of Barley," by Harry V. Harlan, was received for distribution on June 29.

MEETINGS.

The annual Western Agronomic Conference will be held at the Oregon Agricultural College and Experiment Station, Corvallis, Oreg., on Thursday, Friday, and Saturday, July 18 to 20 inclusive. It is hoped that all representatives of the office stationed west of the Rocky Mountains will be enabled to attend. All the agronomic experiments of the Oregon Station will be available for inspection and study and also the very extensive cooperative nursery containing the material for wheat classification studies.

APPOINTMENTS.

The following is a copy of questions which must be answered before the appointment of any person can be recommended. All station and field men who are recommending laborers, stenographers, field assistants, or others, for appointment, must fill out completely one of these questionnaires for each prospective appointee and send it to this office. A large supply of these questionnaires has been mimeographed and copies will be sent shortly to men needing them. The information should be obtained as long in advance as possible in order that the requests for appointments may not be delayed.

APPOINTMENT QUESTIONNAIRE.

1. Name in full.
2. Where born.
3. Day, month, and year of birth.
4. Of what nationality (citizenship) is proposed appointee and what is the nationality (citizenship) of his parents?
5. Is he a citizen by birth or by naturalization?
6. Was naturalization secured through his own or his father's naturalization?
7. Give date and place of issue of final papers in either case.
8. If foreign born and not naturalized, what steps, if any, have been taken to obtain citizenship?
9. If of military age, what is draft status, including (1) draft number, (2) serial number, (3) class number and subclass letter, (4) address of local board, and (5) probable date of call?
10. What is legal residence of proposed appointee?
11. What is his permanent address?
12. Is proposed appointee completely loyal to our Government?
13. What was the character of the inquiry made to ascertain loyalty?
14. Who conducted the inquiry regarding loyalty and vouches for loyalty?
15. To what secret societies, clubs, or social organizations does the proposed appointee belong, or has he belonged during the past five years? (This does not include religious bodies.)
16. For whom has proposed appointee worked during the past five years?
17. Has proposed appointee been employed in any branch of the Government service during the past twelve months, and if so, at what salary?
18. Where employed at present and at what salary?
19. Schools attended, number of years in each, and degrees received.
20. What is the experience of proposed appointee in the subject in which service is to be rendered?
21. State in full the necessity for appointment and duties in detail.
22. Lowest salary which will be accepted.

REIMBURSEMENT ACCOUNTS FOR TRAVELING EXPENSES.

Special attention should be given to the preparation of reimbursement accounts. Men new to the Government service frequently have considerable difficulty in obtaining reimbursement for legitimate traveling expenses because they do not use sufficient care in obtaining subvouchers and in preparing their accounts. Others experience annoying delays in obtaining reimbursement because of failure to fill out itinerary reports, slips showing purchase of mileage, and statements of use of mileage, which must be sent in to this office before expense accounts can be audited and paid. All these matters are covered by the fiscal regulations, printed copies of which are furnished. Samples of the different vouchers, correctly filled, are shown in the fiscal regulations. Below are listed a few of the more important items, lack of attention to which causes delay and suspension in connection with reimbursement accounts. These are given merely as suggestions. The fiscal regulations should be studied carefully in connection with these items as well as the many others which are not mentioned here.

ITINERARY REPORTS.

More expense accounts have been delayed by lack of itinerary reports than from any other one cause. Blanks for use in making these reports are furnished. Each covers a period of one week and should be mailed to this office promptly at the end of each week.

SUBSISTENCE.

Maximum Charge for Daily Subsistence. The total charge for subsistence in any one day must not exceed $5. Subsistence includes meals, lodging, tips to waiters, and laundry expenses. Where lodging is a pullman berth this is not included in the $5 minimum.

Subvouchers for Meals and Lodging. Special care should be taken to fill these vouchers completely and see that they are properly signed. Each day is divided into fourths, three meals and one lodging. The first and last subsistence expenses must be plainly shown, as for instance: "Dinner, July 1, to supper, July 2." The lodging for the entire night is considered as belonging wholly to the day in which it starts. A voucher for a single night's lodging should show lodging only for the date in which the lodging began, and not also the date of the morning in which it ended.

Subvouchers for Meals without Lodging. Subvouchers will be required for meals procured in the same city, town, or place for an extended period (a week or more), unless it be shown that they were paid for at the time obtained and not in a lump sum at the end of the period.

Tips in Certain States. Certain States (Arkansas, Iowa, Mississippi, South Carolina, and Tennessee) have anti-tipping laws. No reimbursement can be asked for tips given within such States.

Receipts for Laundry Expenses. The bills accompanying clothes laundered by commercial laundries are sufficient receipts, provided they show the name of the person for whom the work was done and the date when the work was paid for. It is not necessary to have them receipted by an officer of the laundry or of the hotel through which the work was done.

TRANSPORTATION.

Transportation Requests. These have the same value as money and must be safeguarded as such. The coupons detached from them should be sent to this office at intervals. Do not hold them to transmit with your expense account. Be sure to keep a record of the use made of them on the stub remaining in the book in order that you may have the record when making up your expense account. When you leave the Government service, be sure to return to this office all unused transportation requests and mileage. Your final expense accounts and salary vouchers will not be paid until this material is received and accounted for.

Purchase and Use of Mileage. Where a mileage book is purchased, a record of the transaction must be sent to this office on the form used for that purpose. When an expense account is submitted, a statement, in duplicate, of the mileage used must accompany the expense account. This statement must be filled completely in accordance with the instructions on the back thereof. No expense account will be audited and paid until these forms showing the purchase of mileage and the use of mileage are received.

War Tax on Railroad Tickets. No reimbursement can be asked for the war tax on railroad tickets. If cash fare is paid, tax exemption certificates must be filled out and presented to the ticket agent at the time of purchasing ticket if the cost of the ticket is more than 35¢. These certificates are furnished by this office to each traveler. A supply should be kept in hand. If transportation request is used in purchase of tickets, no exemption certificate is necessary as the transportation proves that the travel is for the Government and no tax can be collected. No receipts are necessary for cash fare paid, but the initials of the railroad and the name of the towns between which cash fare was purchased must be shown in the expense account.

Receipts for Pullman Fares. All charges for chairs, seats, or berths in chair cars or sleeping cars must be supported by receipts. The checks issued by the conductors to passengers using such accommodations are sufficient receipts.

Subvouchers for Livery Hire. If the service extended over more than one day, the actual dates on which the conveyance was used must be shown. The subvoucher must show also the approximate number of miles traveled or the number of hours used and the rate per mile or per hour charged for service.

Use of Automobiles. The use of an automobile for ordinary livery purposes is included in any authorization which permits travel. Care should be taken, in obtaining subvouchers, to state the distance traveled or the hours used and the rate per mile or per hour.

When it is desired to use an automobile for a considerable period of time, as in making field surveys and similar work, this must be especially authorized or reimbursement will not be allowed. When it is decided that this method of travel is the most advantageous to the service, great care must be taken in the arrangements made to pay for the use of the machine. Determine how the automobile can best be hired, whether by the mile or for a time period (day, week, or month), and also whether with or without payment for oil and gasoline used. When charges for oil and gasoline are submitted, a certificate should be attached to the account setting forth the fact that the charge for gasoline and oil was arrived at by actual measurement at both the beginning and end of the official trip. The mileage of each trip should also be plainly stated.

When expenses of this sort are incurred jointly with others, reimbursement is allowed in proportion to the number of persons sharing the conveyance, i.e., one-half of the aggregate joint expenses when the conveyance is shared with one person, one-third when shared with two other persons, and so forth. All joint expenses must be paid in cash, and the account must clearly show the number of persons sharing in the joint expenses.

When the price agreed upon for the use of the machine includes the services of the driver, this must be shown in the subvoucher. If the services of the driver are not included in the price, a separate subvoucher should be taken covering payment for his services. If it is intended to pay for his meals and lodging during the trip, this permission also must be included in the authorization or the expense will not be allowed.

EXPENDITURES MUST NOT EXCEED AMOUNT NAMED IN AUTHORIZATION.

Men must be careful not to exceed the limit of expenditure named in their authorization. Remember that all the expenses covered by the use of transportation requests are charged against the sum named in the authorization. If, as a field trip continues it becomes evident that there is not enough money in your authorization to complete the trip, write or wire asking for the additional amount needed. Do not spend in excess of the amount authorized until informed that more funds will be provided. Unless care is taken in this particular, the amount spent in excess of the amount authorized may be disallowed and repayment refused.

MISCELLANEOUS.

Time of Departure from and Arrival at Permanent Station. This must be shown in the expense account before the account will be passed. The simple entry: "Left ------ at 6:40 a.m." is sufficient, and the same when returning to permanent station.

Baggage Checking or Porterage. Where charge is made for checking or porterage of baggage at stations and hotels, the number of pieces included must be shown if the charge exceeds 10¢, which is the limit allowed for a single piece of baggage.

Rubber Stamp Signatures. Such signatures are valueless on receipts. Signatures must be autographed, preferably in ink. The name of the hotel may be stamped with a rubber stamp but the name and title of the receipting officer must be written, not stamped.

Subvouchers for Telegraph Charges. The proper subvoucher to cover a charge for payment of telegraph fees is an exact copy of the message paid for. This copy may be on a telegraph blank or on an ordinary piece of paper, but must include the exact address and signature as well as the message. It is not necessary to have the agent sign a receipt on the copy of the message.

Subvouchers for Purchase of Supplies. The quantity of each article purchased must be shown and also the price per unit of quantity, i.e., pound, bushel, dozen, etc. Be sure your authorization permits the purchase of miscellaneous supplies.

REHABILITATION OF DISABLED SOLDIERS ALONG AGRICULTURAL LINES.

June 26, 1918.

MEMORANDUM FOR HEADS OF OFFICES.

Gentlemen: Major A. C. Monahan of the Sanitary Corps, Surgeon General's Office, has informally advised Assistant Secretary Pearson of his desire to know of men in this Department qualified to render good service in the educational work for returned wounded soldiers in the hospitals. About sixty men are now engaged in such work and more teachers are needed. The teaching work includes instruction along practical agricultural lines, and Major Monahan especially desires to learn of men in the Department who might give good service who are desiring to enter the military service or who are likely to be called under the Selective Service Act. I would be glad to know of any men in your force likely to be interested in the above mentioned work who would be well qualified as teachers along the above lines.

Major Monahan is also looking for three civilian instructors to teach Agronomy, Animal Husbandry and Truck Crops to wounded soldiers convalescing on a farm. These positions call for good teachers and the pay may reach as high as $2500 per annum. Service may probably last for some time after the war.

I should be glad to consider any names you suggest for these appointments. A similar inquiry is being made throughout the Bureaus of the Department having to do with plant and animal production.

Very truly yours,

Wm. A. Taylor, Chief of Bureau.

UNITED STATES DEPARTMENT OF AGRICULTURE.

Bureau of Plant Industry.

Office of Chief of Bureau. July 1, 1918.

RESTRICTION ON RAILROAD TRAVEL NECESSARY.

MEMORANDUM FOR HEADS OF OFFICES.

Gentlemen: In view of the increase of the cost of official travel that will inevitably result from the recent order of the Director General of Railroads increasing passenger rates on all railroads under government control, the Secretary has instructed the administrative officers of the Department that greater economy must be exercised in planning the activities for the fiscal year, 1919. As no provision for this increase was made in the estimates or the appropriations for the fiscal year, it will be necessary to restrict travel wherever it is feasible to do so in order to conserve funds for the prosecution of the essential activities of the Department. It is also important from the standpoint of the public interest to reduce as far as possible the burden upon the transportation system.

Every proposal for travel should be carefully scritinized, and when it is not entirely clear that the travel is urgent and essential, the request should be disapproved. The thoroughness with which heads of offices and others having to do with the preparation of requests for travel authorizations consider such requests before transmitting them to this office will determine to a considerable extent the promptness with which such requests can be handled.

Your most earnest attention to this matter is desired at this time when the travel for the remainder of the crop season is being determined.

Very truly yours,
Wm. A. Taylor, Chief of Bureau.

CENTRAL
JUL 17 1918
PLANT

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10. July 10, 1918. No.8

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OFFICE ACTIVITIES

PERSONNEL.

C. W. Hungerford, who has been assisting Dr. Stakman in the conduct of the campaign for barberry eradication, with headquarters at University Farm, St. Paul, left July 5 for Corvallis, Oregon, where he will resume his work in the investigation of stripe rust, Puccinia glumarum.

Dr. C. E. Leighty, Agronomist in Charge of Eastern Wheat Investigations, will leave Washington July 11 to study the wheats in the cooperative experiments at Cornell University and to discuss breeding plans for cereal breeding in the future.

Dr. H. H. Love and Mr. W. T. Craig, of the Department of Plant Breeding at Cornell University, and representatives of this office in the cooperative plant breeding at the Cornell Experiment Station, returned to Ithaca on July 3 from their study and harvesting of the hybrid breeding nursery at Chico, Cal. Notes on some results obtained there this season will appear in connection with the discussion of the wheat project in the next issue.

Charles S. Reddy, district leader of the campaign for smut control and eradication in the Great Plains Area, returned to Washington on June 10 for conference on the matter of campaign advertising.

J. M. Shull, botanical artist in the Office of Fruit Disease Investigations, has been authorized to proceed to the Carolinas July 15 to make illustrations from nature of the Physoderma disease of corn in connection with the work of Dr. Tisdale.

Professor L. J. Stadler, Assistant in Farm Crops at Missouri Experiment Station, and Agent of this office in charge of the cooperative work there, has been absent from the Station since early in May. He was detailed for some college work in St. Louis, but returned to Columbia early in July.

Dr. E. C. Stakman, Pathologist in Charge of the Barberry Eradication campaign and the Stem Rust Survey, who has been in Washington for two weeks in connection with the enlargement of the work in the new fiscal year, will leave Washington July 11 for his headquarters at the University Farm, St. Paul. En route he will visit Pennsylvania, New York, and New England, to consult State officials with reference to the need for control measures in those States.

VISITORS.

President W. M. Jardine of Kansas Agricultural College was a visitor at the office on July 5. He expressed himself as confident of the ability of Kansas to sow a very large winter wheat acreage again this season.

Professor C. A. Zavitz, Agronomist of the Ontario Agricultural College at Guelph, was a Washington visitor on July 10. He reports the loss of about 55 per cent of winter wheat acreage in Ontario, due to severe winter conditions. He desires to obtain about 100,000 bushels of seed wheat for use there this fall. Since Dawson (Dawson's Goldenchaff) is the leading variety in Ontario, most, if not all, of the quantity desired is of this variety. Since it is also the leading variety of winter wheat in New York State, Professor Zavitz went to Cornell University for the purpose of locating a suitable supply in that section.

PUBLICATIONS.

Farmers' Bulletin No. 972, entitled "How to Use Sorghum Grain," by Carleton R. Ball and Benton E. Rothgeb, was received on July 9 for distribution.

THE APPROPRIATION BILLS.

The funds for the Office of Cereal Investigations, in the fiscal year 1919, which began July 1, are carried in two appropriation bills. As noted in the Courier of May 20, The Agricultural Appropriation bill carries items totaling $401,505, while the Food Production bill contains a total of $178,250.

On June 30, the last day of the old fiscal year, neither bill had been passed. To date (July 10) the Agricultural bill has been passed but not yet signed by the President, while the Food Production bill is before the Senate. The customary continuing resolution was not passed and made effective until the night of July 8. While the provisions of the resolution are somewhat more generous than usual, expenditures must be held below the normal for July, or so long as the resolution continues.

FIELD STATION CONDITION AND PROGRESS.

HUMID EASTERN STATES.

LOUISIANA.

Crowley Rice Station, Crowley. (J. Mitchell Jenkins) Frequent rains during the first two weeks in June delayed oat threshing and the seeding of soy beans, and prevented the cultivation of early soy beans and corn, resulting in rapid growth of weeds. Rain on the 12th was accompanied by hail, which lasted about 20 minutes. The stones ranged in size from ½ to 2½ inches in diameter. No damage to crops was reported due to the fact that the hailstones, while very large, were few in number.

The weather during the latter part of the month has been unusually warm and dry, and the lack of precipitation is allowing salt water to back up into the irrigation streams. Pumping plants near the Gulf have shut down and others will have to do so within a few days if heavy rains do not occur. It is said that in some localities farmers are using water containing as much as 200 grains of salt per gallon on young rice that is being irrigated for the first time. Unless fresh water is soon added, this rice very probably will be killed. Reports are to the effect that the greater part of the crop is in good condition and well flooded with fresh water. However, with the present hot weather and great evaporation, additional water will soon be needed unless rain soon occurs.

Rice in the vicinity of the Station is very fine and fields are cleaner than ever before. This is due in a large measure to the now almost universal practice of seeding all levees. In the past it was the usual thing to see levees grown up in grass and weeds. It is now the exception to see such levees.

Mr. Juan O. Chioco, Philippine Islands, now a student at the Louisiana State University, arrived on June 2 to make the Station his headquqrters during the summer, while making a study of the rice industry in this section.

GEORGIA.

State Experiment Station (Athens) and Substations. (Loy E. Rast) The thrashing of small grain has been completed at Douglas and Tifton substations. At the end of June the work of determining the yields was being done at the College as rapidly as possible, and it was expected that the results would show the best grain crop produced in several years.

NORTH CAROLINA

West Raleigh. (Gardner M. Garren) All small grains in the cooperative experiments have been harvested and stored in barns. The thrashing is partially done.

In the State the whest crop that was so promising the first days of May has proved a keen disappointment at harvest time. A prolonged spell of dry hot weather during the ripening period caused the heads to fill poorly and the kernels to shrivel. The thrashing in the strictly wheat-growing sections of the State is now in full blast and the farmers report not more than a fifty per cent yield. Doubtless this estimate is too low, since the farmers are very much discouraged over the disappointing returns from such promising prospects earlier in the season. We are hoping that after the thrashing has been completed and the returns are all in that it will be found that the yield this season more nearly approximates that of a normal season.

VIRGINIA.

Arlington Farm, Rosslyn. (William C. Eldridge) Ideal weather for the ripening and harvesting of grain obtained during the greater part of June. The total precipitation was 2.83 inches; maximum temperature 97° (June 1), minimum temperature 46° (June 24).

Winter wheat and oats probably have never before matured in better condition. The straw and chaff is bright and clean and free from any weather stain whatever.

Harvesting of wheat in field plats was completed on June 27, and on June 30 harvesting of wheat and oats in nursery rows was nearly completed. Thrashing of barley from field plats and nursery rows was in progress at the end of the month. The yields from barley varieties was from 25 to 40 bushels to the acre.

The grain sorghums in the trilocal experiment have been thinned and in spite of rather cool weather have made considerable growth.

In surrounding territory in Maryland and Virginia a much better crop of wheat has been harvested than conditions earlier in the season indicated.

NEW YORK.

Cornell Experiment Station, Ithaca. (H. H. Love)

Wheat. Cool weather with plenty of rain has been very favorable to the development of small grains and the winter wheat nursery is looking very well, including even the portions where winter injury was considerable. The wheat is all headed and some of the earlier forms are beginning to ripen. Harvest will be at least ten days earlier this year than last. In the wheat nursery a number of new hybrids are showing up in a very promising way. It is hoped that some of these forms will be worth while for future work.

In the head-row series which consists of new selections made throughout the State last year, a number of very promising types have appeared. The classification series of wheats is looking well, with the exception of the less hardy forms which were winterkilled. The series which consists of the varieties collected from the several States and sown here last year for the first time, is looking very well and much material may be obtained from these varieties.

The hybrid wheats, on the whole, came through the winter very well and are all fully headed and will furnish considerable material for further study of the inheritance of various types of wheat. There are also a number of new types which seem very promising so far as their commercial value is concerned.

Oats. The oat nursery is looking very well. The earlier forms are almost fully headed and the later ones are just beginning to head. The crop promises to be very good and since we have a larger number of new forms under test we expect considerable valuable information on these new types. A large series of head rows, which consists of new selections and new hybrids, is doing well and a number of differences can be readily observed. The hybrid series and pure line series are growing well and promise to give a good crop. A number of new hybrid combinations are being grown this year, particularly of the sativa-sterilis crosses.

The barley nursery is well headed and promises a good crop. A number of new head selections are being grown in head rows which are showing some interesting differences. Some new hybrid combinations also are being grown in this head-row series.

In addition to the above, the breeding work which is being done in various places in the State, particularly in Jefferson and St. Lawrence counties with oats, Albany county with rye, and Onondaga and Cayuga counties with barley, is doing well and harvest will begin with rye next week. In the barley series, new selections have been sown in each of the two counties and the oat work consists of testing new selections, also continuing the tests of selections made in former years.

MISSOURI.

State Experiment Station, Columbia.(L. J. Stadler) The wheat varieties in rod rows went through the winter with scarcely any winterkilling and the yields in general were extremely good.

Since May 7, Mr. Stadler has been detailed to St.Louis on college work.

IOWA.

State Experiment Station, Ames. (L. C. Burnett). Oats and barley developed rapidly during the month and cutting will start July 15. Indications are that the yield will be better than the average. Excessive rain accompanied by hail early in June caused floods which did considerable damage in the community but the injury to the cereal plats on the Station was not heavy.

GREAT PLAINS AREA.

TEXAS.

Amarillo Cereal Field Station, Amarillo. (John F. Ross) The weather data for the month of June is as follows: Maximum 106 on the 29th, minimum 53 on the 1st; average hourly wind velocity 7.8 miles; precipitation 1.19 inches, nearly all of which fell on the 5th, 6th and 7th, and evaporation 9.799 inches.

The drouth is very severe. All the spring small grains as well as the winter grains reported previously are practically a total failure. A few plats of spring wheat, and oat plats on the D.L.A. project which caught some of the runoff will make a few bushels of grain. Row crops are small and backward. The prairie grass is dry enough to burn. Rains must come soon or there will be a great scarcity of feed in this part of the country this fall.

OKLAHOMA.

Woodward Field Station, Woodward. (John B. Sieglinger) The total precipitation in June this year was only 1.91 inches, while the 10-year average (1908-1917 inclusive) for this month at Woodward is 3.27 inches.

The maximum temperature for the month was 105.5° on June 24, the minimum temperature was 59° on both June 29 and 30. Hot winds visited us daily from June 19 to 29, inclusive, with the exception of the 22nd.

The chief work for the month has been thinning the plats to comparable stands. The plats were lined and trimmed. Some weeds have been hoed out.

In spite of the period of hot dry weather, the sorghums and broomcorn are making rapid growth at present. Harvesting wheat is practically finished in the county.

KANSAS.

Fort Hays Branch Station, Hays. (F. A. Kiene, Jr.)
The month of June has been dry and very hot. Only .53 of an inch of rain fell, in three small showers. The mean maximum temperature for the month was 92.6°, and on 16 days from the 11th to the end of the month temperatures over 95° occurred.

The wheat began to dry up on June 17 and on the 23rd harvest began. Many farmers have finished and work in this county will end about July 5. The experiment station will finish harvesting a total of 750 acres of small grain crops early in July. Yields will be light and quality poor. Wheat is estimated at 10 bushels per acre and weight 55 lbs. per bushel.

Barley will not yield more than 15 bushels and weight will not be over 30 lbs. per bushel. It cannot be used for milling.

Oat yields and weight will be very light.

Sorghums have made slow growth and both the sorghums and corn are suffering from the drought.

Alfalfa has made very little growth during the month and will not make a second crop until a good rain falls.

Acting Director Call and Professor Parker of Manhattan visited the Station on June 15 and spent the whole day in the fields and on the plats. They reported harvesting operations in progress as far west as Abilene, Kansas.

COLORADO.

Akron Experiment Farm, Akron.(F. A. Coffman)
Weather. The weather conditions during the month of June were very unfavorable for all cereal crops in eastern Colorado. The month, as a whole, was hot, dry and windy. During a few days hot winds were experienced. The highest temperature reached during the month was 101° on June 15. This is the highest daily maximum recorded at Akron field station for several years. The minimum temperature was 43° on June 1. From June 1 to June 21, two traces of precipitation were recorded, while the total monthly precipitation was 1.33 inches. A rain of .60 of an inch fell June 24.

Field Station Notes. All of the winter wheat in plats on the station is fully headed. The early sowings in the date of seeding of Kharkov (C.I.No.1583) and the plats of Armavir, Kanred, and Nebraska Hybrid are all starting to ripen. The heads seem to be fairly well filled. In the nursery the winter wheats are in full head. A few of the earlier selections of Nebraska Hybrid are ripening. This variety of wheat shows itself to be a hybrid, it appears, as selections taken from last year's varietal plats show markedly different characters as to date of ripening. Some promising looking selections of beardless hard winter wheat are seen in the nursery.

The plats of spring wheat on the fallow land do not seem to have been seriously affected by the drought. In a few plats

of the later maturing varieties on the cornstubble it is doubtful whether all of the plants will ever head. The plats of Prelude, Erivan, Galgalos, and all of the durum varieties look well, but the plats of Power and Haynes are severely hurt by lack of moisture.

The early varieties of oats have not suffered greatly from the drought while the late varieties are injured so severely that in a few plats not over 40 per cent of the plants will ever head. The plats of Burt and Sixty Day have just started to ripen.

The plats of barley have withstood the adverse weather conditions fairly well. The early varieties have made much the best showing.

The plats of Blackhull are ripening quite rapidly and the plats of Nokano Waso will soon be ready to harvest. Most of the other varieties have just started to ripen.

The plats of Hanna and Orel have not yet entirely headed. The plats of White Emmer are not yet fully headed. The plats of Proso are being almost taken by the weeds. The ground was fallowed last season.

Wheat. The condition of the winter wheat in this section of the State is estimated at about 50 per cent of what it was May 1. This is a rather low estimate but in many localities no winter wheat will be produced. The country is very spotted. Wheat sown on breaking or on summer fallow will produce fair yields. Much of the wheat stubbled in will produce little or nothing. The winter wheat is ripening very rapidly on account of the dry weather and, as a result, is filling very poorly.

The condition of the spring wheat is about the same as that of the winter wheat. In many fields, poorly prepared, nothing will be harvested, while where the ground was given sufficient preparation, fair yields can be expected. Most of the spring wheat is in full head. While the wheat condition on June 30 was far below the condition on May 1, the increase in the number of acres sown to wheat in eastern Colorado will more than make up for the loss in acre yield, so that more bushels of wheat will be harvested in eastern Colorado this year than last. The quality probably will be about the same.

Other Small Grains. Very little rye is grown near Akron, but fair yields will be produced in the few fields sown. The condition of the barley generally is much better than that of the other small grain crops. The dry weather does not seem to have checked the growth of the barley in most fields. Oats have suffered more than any of the other crops as the result of dry weather. Much of the crop will never head.

Corn. The condition of the corn in eastern Colorado is excellent. The dry weather during planting time reduced the stand but the lack of moisture during June has not been noticeable, to any extent, in the growth of the plants.

Other Crops. Sorghum crops are growing well and have not seemed to notice the adverse weather conditions. Potatoes are growing well and are just starting to blossom. A large acreage of Pinto beans have been planted in eastern Colorado this year and the condition of the beans is excellent.

WYOMING.

Cheyenne Experiment Farm, Archer. (Data from Reports of Office of Dry Land Agriculture Investigations.) The weather during the month has been very favorable to crop growth. On June 15 the winter rye had headed and winter wheat was starting to head. The precipitation for the week ending June 22 was 2.58 inches, which completely saturated the fields and filled the buffaloe wallows. Cloudy weather followed which prevented rapid evaporation from the soil and crust formation.

SOUTH DAKOTA. (Manley Champlin).

General. There has been very little rain during June except local showers. Some localities have had plenty of rain while many others have suffered severely. There is a marked contrast in the condition of the crops according to the farm management methods employed. Some fields which have never been manured or rotated systematically are almost a failure at the present time while others immediately adjoining are in excellent condition. The good effect of early seeding and the use of early varieties is also apparent at the present time in many localities.

Brookings. Rye, barley, early oats and early wheat are heading well. The lower leaves in some of the fields in the vicinity have wilted, due to the extreme heat prevailing June 13-15. There is also some evidence of blights which apparently belong to the Helminthosporium group.

Cottonwood. There has been very little rain during the month and cereal crops are showing the effects of drouth. The lower leaves are fired badly in many instances. The cultivated crops are quite promising.

Eureka. Light showers have occurred at intervals during the month, but not sufficient to supply the needs of the cereal crops. Lower leaves are quite badly burned, but the crops promise to make a fair yield if one or two more showers occur before harvest time. All of the earlier cereals are heading. Corn is in good condition.

Highmore. With the exception of considerable loss of the lower leaves due to drouth, crops are still in good condition and with one or two showers promise to make a fair yield. The cereal nursery has not been seriously affected by the drouth as yet. The heat wave during the week ending June 15 was broken by a shower that occurred early in the morning of June 16. Since then the temperature has been relatively low for this season of the year and effects of moisture shortage have not been as marked as in the preceding week. First crop of alfalfa and all of the hay mixtures were harvested during the last two weeks in June.

Vivian. Drouth conditions similar to those reported at Cottonwood prevail at Vivian. First crop of alfalfa has been harvested. Small grain is suffering from the drouth but corn is promising.

NORTH DAKOTA.

Northern Great Plains Field Station, Mandan.

(J. C. Brinsmade) The maximum temperature for the month was 100°, on June 11, and the minimum 38°. The total precipitation was .68 of an inch.

Oats began to head about June 20. Sixty Day oats was fully headed on June 30 and other varieties were heading rapidly. In the earliest flax varieties first flowers appeared on June 22. Since then all flax varieties in field plats have begun to bloom. Marquis wheat began to head on June 27, closely followed by the other varieties on subsequent days. At the end of the month all barley varieties were heading.

Weeds among the flax have been very plentiful, due to the fact that the summer-fallowed land, on which most of the flax was sown, was not spring plowed. The disked corn ground on which some of the flax was sown, was almost as weedy. It seems desirable to plow in the spring before sowing flax, whatever the previous preparation of the land may be. The land for the flax experiments in 1919 has been sown to potatoes this year and will be plowed in the spring before the flax is sown.

The general condition of the crops is excellent, considering that there has been no rain here since June 18. Splendid yields are to be expected if a good rain comes very soon. If rain does not come, however, there may be no crops at all. Reports from localities north of here are to the effect that some of the crops are being burned up.

Dickinson Substation. (Ralph W. Smith) High temperatures have prevailed during most of the month of June, causing rapid development of all crops. There have been many hot still days but scarcely any hot winds. The maximum temperature was 97 degrees (June 10), minimum 35 degrees (June 4); precipitation 1.49 inches. The only rain of importance was a local dashing rain of 1.24 inches on June 8. This was followed by hot, drying weather that left a crust on the surface of the ground. This interfered with the emergence of flax so that while flax sown since the rain came up with a good stand, that sown just before is thin and spotted.

There has been practically no rain since June 17. While winter rye and early-sown spring wheat are still in fair condition, oats are in bad condition and rain is badly needed to insure a crop of any grains. Local rains have relieved the drouth in places but localities to the south and west are reported to be much worse than here.

Cut worms have done much damage in corn and in some cases have injured small grain. A local outbreak of army worms

is reported near Dickinson. Grasshoppers are getting very numerous in the southern part of the county. The County Agent obtained by the county last spring is organizing campaigns among the farmers to combat these pests and it is hoped that they will be held in check

Early sown Marquis and durum wheat are heading. Sixty Day oats, Gatami barley, and spring rye are almost fully headed and winter rye will begin to ripen in a few days. Corn is looking especially good where the stand is not reduced by cut worms.

The nursery has received a second cultivation and hoeing. The plats are being trimmed. Crosses are being made among different varieties of winter wheat.

Preparations are being made for a community picnic and patriotic program to be held at the Substation July 4.

Professor J. H. Shepperd of the State Experiment Station and Superintendent U. J. Downey of the Hettinger Substation visited the Substation June 26.

MONTANA.

Judith Basin Substation, Moccasin. (P. V. Cardon, Office of Dry-Land Agriculture) The month of June has been characterized by a variety of unusual weather. Dry and exceptionally warm weather obtained during the forepart of June, the temperature for several consecutive days rising to a maximum of 95°, accompanied by rather high winds. This was rather severe on the crops, especially the forage crops, such as alfalfa. The cereals, however, did not show any injury, although they made slow growth. About the middle of the month a series of light showers relieved the situation as regarded the cereals, but came too late to benefit the alfalfa which was very short and of a brownish cast. The latter part of June was characterized by cloudy and often cool weather. Little rain fell, however, and the total precipitation amounted to only 1.55 inches, being about half the average for June at this Station.

During the first part of the month many farmers in this vicinity displayed some anxiety for their crops, as the situation was threatening to become serious. In the Judith Basin, June is commonly referred to as the rainy month, and farmers confidently look forward to its rainfall, which ordinarily successfully carries the grain through the heading stage in its development. Hence, when a dry June threatens it is not surprising to find great concern shown, not by farmers alone but by bankers and merchants who are vitally interested financially. Now, while June did not bring all the rain desired, or even expected, conditions have improved materially and the anxiety of the farmers appears to have been relieved. Winter wheat generally and, on many fields, spring wheat as well, is in full head, promising to yield well, provided July brings rain to help fill the kernels normally.

The cereals on the Station, despite the rather unfavorable weather of the past month, have made fairly good growth. Winter rye, long in head, is rapidly approaching maturity with a promise of good yields. In view of the success of winter rye in this locality, it is remarkable that so little of this crop is grown here. It survives the winter better than wheat, it yields as well or better, is considerably earlier and, on the present market, rye is more profitable. Winter wheat, as already suggested, is just now reaching the full-head stage, which will make it at least two weeks later than the rye. Of the spring cereals, barley is in the lead so far as heading is concerned, the earlier varieties of oats and wheat following in the order named. Flax is short in straw, but is commencing to show blooms in profusion.

WESTERN BASIN AND COAST AREAS.

UTAH.

Nephi Substation, Nephi. (Aaron F. Bracken).

During the first half of the month temperatures were unusually high and threatened to prove disastrous to the dry-farm crops throughout the State. Cutworms did considerable damage on the Station and to grain on surrounding farms. They reduced stands at least 10 per cent. The damage on the Station was most severe on land that had been continuously cropped to wheat. In one area of 200 square feet 28 worms were found.

The period of unusual high temperatures previous to June 15 was followed by unusual precipitation. The quantities were: .10 of an inch on June 15; .37 of an inch on June 17; and 1.01 inches on June 20, making a total quantity of 1.48 inches. The last inch fell in sixty minutes. Due to the extreme dryness of the soil this heavy downfall was not readily absorbed. The flood that followed did considerable washing of the soil and almost resulted in the loss of our station car. Fortunately a team followed and gave help or a Ford would have added its bit to the building up of the Ridge soil.

This rain, although doing considerable damage in some parts of the State, saved most of the wheat from failure. Fields that were burning during the hot weather revived and from present indications the yields of grain will be almost normal. The rain did considerable good here on the Station too. All grain plats are sure to come through with good yields now and the tilled crops such as corn, peas, potatoes, and beans never looked better at this time of the year.

During the last two weeks the work here on the Station has been limited to weeding and making new stakes for the nursery and soil sampling. The latter, for the midsummer period, began June 28. We are well up with the work.

IDAHO.

Aberdeen Substation, Aberdeen. (L. C. Aicher)

The weather during the early part of June was the hottest ever experienced in the district. On June 8 to 14 inclusive the temperatures were 92, 95, 96, 100, 99, 96 and 92 degrees on the respective days. The hottest weather since records were kept at the Station has been 97 degrees in July and August of previous years.

Since the middle of June the weather has been warm and crops have grown rapidly. The dry land crops in the immediate vicinity of the Station are poor. A rain of .57 of an inch on June 23 freshened up the crops a little and will aid some in the filling of the grain.

The irrigated crops are not as good as last year. Good stands of cereals, beets, and potatoes are rare. The dry spring and the open winter which preceded it left the soil somewhat dry and the only crops which made a good stand were those which were planted very early. A few very excellent fields of Dicklow wheat have been located. This is pure seed and promises a very high yield. Several fields of pure Trebi barley are looking well and give promise of supplying plenty of seed of this excellent variety, for distribution this fall. All farmers who received lots of the Dicklow seed distributed last fall by the Superintendent are exceedingly well pleased with the crop. Many of these growers will hold their Dicklow for seed wheat for next year.

Director Iddings of the Idaho Station was a station visitor during the past week. As a result of this trip to the Station, plans for changing the Aberdeen Station to an entirely irrigated Station will be submitted to the Legislature this fall. The plan so far agreed upon and the one which will be submitted to the Board of Education for final approval will include the establishment of a new dry-farm substation in the dry-farm belt ~~of~~ southwest of Aberdeen.

The Superintendent accompanied Director Iddings to the Teton Basin district about 100 miles south of Yellowstone Park. The last Legislature appropriated funds for the establishment of an experiment station at an elevation above 6000 feet. The station will very probably consist of dry farming and irrigation. Bench land and bottom land suitable for dry farming and irrigation respectively have been recommended and, if finally approved by the Board of Education, work in its establishment will soon begin.

Hundreds of thousands of acres of the finest wheat land in the State range between 5500 and 6500 feet in elevation. The proposed substation will serve this excellent territory. The crops in the Teton Basin never looked better. Crops on the Rexburg bench are very good. The pea crop in the St. Anthony district is better than it has been for years. The upper Snake River Valley, from Rigby to the Wyoming line generally, has a better average crop this year than any other section in the State.

Dr. W. P. Headden of the Colorado Station; Professor Graber of the Wisconsin Station; R. J. Leth, Field Agronomist for the Extension Division (Idaho), and Mr. Bennett, Potato Specialist of the Idaho Extension Division, were station visitors during the past week.

OREGON.

Harney County Dry-Farming Substation, Burns.

(John H. Martin) Warm weather prevailed during June. A slight frost occurred on the 29th.

Winter grain is fully headed and spring grain partly headed. The dry land grain will probably be a failure owing to drouth. The cereal plats on irrigated land are being irrigated at present.

Grasshoppers and ground squirrels are doing considerable damage to crops in the vicinity.

Eastern Oregon Dry-Farming Substation, Moro.

(D. E. Stephens) The month of June in eastern Oregon has been, for the most part, warm and dry. Local thunder showers occurred in some sections, but at the Station the total rainfall for the month was only .12 of an inch, the lowest June rainfall ever recorded. The highest temperature reached during the month was 96 degrees, on the 20th; the lowest, 38 degrees, on the 15th.

Winter wheat is beginning to ripen. Throughout this county the average yield per acre of winter wheat probably will be slightly higher than normal. The yield of spring-sown grains probably will be low.

June 15th was Gilliam County Farmers' Day on the Station. About eighty visitors were present, most of them coming from a distance of about sixty miles.

On June 18-21 a trip was made by auto through the counties of Umatilla, Morrow, Gilliam and Sherman, in company with the County Agents of these counties. The wheat in Umatilla County is much better than last year. The total wheat production of that county will undoubtedly be a little higher than the average. Crops in Morrow and Gilliam counties are not so good as in Sherman County. Thousands of acres of wheat were seen that will not pay to harvest. The best wheat seen in Morrow county was the Early Baart variety. There are approximately 100,000 acres more of Early Baart spring wheat in the Columbia Basin counties of Oregon than last year.

The Eastern Oregon County Agents inspected the Station on the 21st and 22nd. The County Agents of Klickitat and Franklin counties, Washington, were visitors on the 28th. Messrs. Woolman, Bursh, Meier, and Bell, of the Smut Control Campaign, have been on the Station during most of the past ten days making smut and rust estimates in the nursery sown by Mr. Hungerford last fall. Some very valuable data on the smut resistance of winter wheat varieties and on the best

methods of treatment to control smut in winter wheat have been obtained. Delegations of farmers of Sherman County visited the Station on the 25th and 26th.

WASHINGTON.

Adams Branch Experiment Station, Lind. (M. A. McCall) Crop conditions during June have been decidedly discouraging. Continued drouth and high temperatures are resulting in very serious crop damage. Adverse conditions are not alone confined to the drier parts of the State but to the more favorable sections as well.

Crops on the Station are suffering in common with all others. Increase Early Baart has burned to a point beyond recovery on some of the poorer hillsides. The heavier seedings in the rate and date experiments are suffering as are the late seedings and the late maturing varieties in the variety trials. Despite adverse conditions in the early cereal crops, the field peas seem to be standing the dry weather remarkably well. Yields, of course, will be very short but as yet the condition is not proportionately as bad as that of the cereals. Straw is short and special provisions must be made for harvesting all experimental plats.

Of the winter cereals, Turkey Red, Kharkov, and Jones Fife wheats seem to be standing the drouth in the best shape. The wheats are proving more drouth resistant than the winter rye. Of the ryes, Common Local, Minnesota No. 2 C.I. 137, Yellow Von Rumker, C.I. 173, and Green Von Rumker, C.I. 174, are standing out the best. Hansen rye, C.I. 81, Advance C.I. 82, and Swedish, C.I. 137, are already beyond the point where they can be helped by any rain or cooler weather. Straw of these three varieties has been so dried out that much of it has been broken off in the high winds.

Seed storage facilities have just been completed on the Station, and out-buildings and fence posts surrounding the Station buildings have been given a coat of paint.

CALIFORNIA.

Plant Introduction Garden, Chico. (V. H. Florell) All harvesting of cereals has been completed. Head selections from the classification nursery rows have been gathered.

Dr. Love and Mr. Craig finished the harvestinf of the breeding nursery on June 21. Mr. J. Allen Clark also completed his work at the same time. Mr. Benton E. Rothgeb, in charge of Grain-Sorghum Investigations, was a visitor at the Plant Introduction Garden on June 25.

Biggs Rice Field Station (J. W. Jones) Water is being held on the rice plats. There apparently is a shortage of water in the rice section, but the Station has had plenty to date.

It is difficult to get men to pull water grass. There is a movement started to import Mexican labor for this purpose. Men are needed at the Station but it has been impossible to secure any.

The weather has been warmer during June. The maximum temperature was 110°. Rice is growing rapidly.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10 July 20, 1918. No. 9

Project Issue

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OFFICE ACTIVITIES

PERSONNEL

C. H. Clark, after a vacation at Skaneateles, N.Y., has proceeded from Syracuse, N.Y., to Minneapolis, Minn., Fargo and Mandan, N.Dak., in the furtherance of flax investigations.

J. A. Clark, Scientific Assistant in Charge of Western Wheat Investigations, left Corvallis at the close of the Western Agronomic Conference to visit the experiment stations at Lind and Pullman, Wash., and Bozeman, Mont., en route to the Great Plains area. He will proceed first to Cheyenne Experiment Farm, Archer, Wyo., to inspect the station and give necessary instructions and assistance to Mr. A. L. Nelson who took charge of our cereal work there on July 18. From there he will proceed to the Bellefourche Experiment Farm, at Newell, S.Dak., where it is hoped to place a new man within a few days.

A. L. Nelson has taken charge of the cereal work at the Cheyenne Experiment Farm, Archer, Wyo., and arrived at the station on July 18. The Cheyenne Experiment Farm has been without a superintendent since May 11 when Mr. V. H. Florell left to take charge of the work at the Plant Introduction Garden, Chico, Cal. Mr. Nelson is a graduate of the Utah Agricultural College, has had post-graduate work at the Kansas Agricultural College and for several years has been in Arizona. During June he was employed by this office in locating and inspecting fields of Early Baart wheat for seed purposes.

Dr. R. D. Rands, who has been in charge of wheat scab investigations since December 1, 1917, resigned from the service on July 13. He has accepted an appointment under the government of Holland to investigate the diseases of rubber plants in Java, and will sail from San Francisco about August 10.

Charles S. Reddy, district leader in the Smut Control Campaign for the Great Plains area, who has been in Washington since July 10, left on July 16 for Montana to supervise the work there.

T. R. Stanton, Scientific Assistant in Oat Investigations, left Washington on July 20 for Ames, Iowa; Lincoln, Nebr.; Akron and Fort Collins, Colo.; and Aberdeen, Idaho, to study experiments with oats and to harvest the extensive breeding nursery at the Aberdeen Substation.

Dr. W. H. Tisdale, who has been in South Carolina since June 29 in connection with his investigation of the Physoderma disease of corn, returned to the office on July 16. He says there has not been much development of the disease in South Carolina this year, due to the dry season.

Charles J. Yackel has been appointed Field Assistant in charge of the cooperative cereal investigations at the Williston Substation, Williston, N.Dak. Mr. Yackel has been a student at the University of Minnesota and has had considerable experience on farms and truck farms in the vicinity of the Williston station.

VISITORS

H. W. Barre, Director of the South Carolina Experiment Station, was a Washington visitor on July 16. At the South Carolina Station we are cooperating in the investigation of the Physoderma disease of corn conducted by Dr. Tisdale.

Lieut. A. D. Ellison, who is in the Gas Defense branch of the Engineer Corps, was an office visitor on July 11. Lieut. Ellison was formerly in charge of the experimental work with cereals at Arlington Farm. He received his commission on July 8 and is at present giving instruction in Gas Defense at Camp Humphreys, Va.

PROJECT CONDITION AND PROGRESS

211-A. WHEAT INVESTIGATIONS

The area sown to winter wheat in the fall of 1917 was 42,170,000 acres. This was the largest acreage ever sown to winter wheat in this country, the next largest being 40,090,000 acres sown in the fall of 1916. This was an increase of 5 per cent. Twenty-four States grew larger acreages of winter wheat in 1917 than in any other year in the last five years.

The area sown to spring wheat in 1918 was 22,489,000 acres (preliminary estimate). This was the largest acreage of spring wheat ever sown in this country, the next largest in recent years having been 19,161,000 acres sown in 1914. The area sown in 1917 was 18,511,000 acres and the average acreage in the five-year period from 1912-16, inclusive, was 18,476,000 acres, or almost the same as that in 1917.

The percentage of abandonment of winter wheat sown in 1917 for the 1918 crop was 13.7 per cent. On a total seeding of 42,170,000 acres, this leaves 36,392,000 remaining for harvest this season. The estimated spring wheat acreage noted above is 22,489,000, making a total acreage of all wheat for harvesting of 58,881,000 acres. The percentage of abandonment of winter wheat sown in the fall of 1916 for the 1917 crop was 31 per cent. The average for the past ten years is 10.9 per cent.

211-B. OAT INVESTIGATIONS.

The area sown to oats in the United States in 1918, according to the Monthly Crop Report of the Bureau of Crop Estimates for June, was 44,475,000 acres. This is 2.1 per cent more than the acreage in 1917, when 43,572,000 acres were sown. According to the Bureau of Crop Estimates, there has been an increase in the oat acreage in the United States each year since 1903. At present, it is more than one-third larger than the acreage 10 years ago, and is more than 6,000,000 acres larger than that of five years ago. The percentage increase in the oat acreage has been larger and more regular than that of either corn or wheat.

The estimates this year show increases in oats in New England and the North Atlantic States, the increases in New England ranging from 10 per cent in Rhode Island to 33 per cent in Massachusetts. In the States from New York to North Carolina the increases are comparatively small, ranging from 2 to 5 per cent. South Carolina shows the largest increase in any State, 35 per cent, while Georgia, Mississippi, and Louisiana show considerable decreases due to loss from winterkilling and also to reduced sowings because of winter loss in previous years.

The great oat-growing States of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, and Iowa all show increased acreages over 1917, due largely to the replacing of corn by oats to some extent in these States.

The reduction of the corn acreage was due to the scarcity and high price of seed corn, and perhaps to some extent to fears of inadequate labor supply.

In North Dakota there was a 2 per cent reduction in oats, as a corollary to a very large increase over last year in winter rye and spring wheat. South Dakota increased her oat acreage 1 per cent, notwithstanding a large increase in rye, spring wheat, and barley. The oat acreage in Nebraska and Kansas was abnormally high in 1917, as oats replaced wheat to some extent on land where that crop winterkilled. It is not surprising, therefore, that this year's figures show decreases in oats in these States.

Texas, Oklahoma, and Arkansas show considerable increases, while the western States, with the exception of Washington, either maintained their 1917 acreage or decreased it. In Washington the oat acreage was increased 6 per cent over the previous year.

The July crop report showed a condition for the oat crop of the entire country of 85.5 per cent, which is 1 per cent higher than the 10-year average, and 3.9 per cent lower than in July of last year, when the largest crop on record was produced. The forecast based on this July 1 condition is for a crop of 1,437,000,000 bushels, a yield which has been exceeded only in 1915 and 1917. All of the large oat-producing States show a condition well above the 10-year average, except Nebraska and Kansas, where extremely hot weather late in June was detrimental to the crop, and Texas and Montana, where continued drought has materially reduced prospective yields. In June the most favorable condition of the crop was shown in Iowa, Wisconsin, Minnesota, and South Dakota.

211-C. BARLEY INVESTIGATIONS.

The barley acreage for 1918 is estimated at 9,108,000 acres, or 3.1 per cent more than the 1917 acreage. The estimates show large increases in Ohio, Indiana, Michigan, Illinois, Iowa, and Nebraska, amounting to as much as 47 per cent in Illinois. In the more important barley producing States of Wisconsin, Minnesota, and South Dakota the increases are 18, 4, and 10 per cent respectively. These increases are no doubt due in a large part to the high prices of barley shortly before the seeding season. In North Dakota, however, where a large part of the seed had to be purchased because of crop failure last year, the high price was a factor in reducing the acreage which is only 93 per cent of that of 1917.

In the important barley producing State of California 3 per cent reduction is shown due to the fact that the wheat acreage was largely increased. In Oregon the 1917 acreage was maintained; in Washington there was an increase of 2 per cent; and in Idaho a five per cent reduction from the 1917 acreage.

The condition of the barley crop on July 1 for the entire country was 84.7 per cent, which is exactly the ten-year average. The indicated production based on this condition is 229,816,000 bushels, about one million bushels more than the record crop of 1915. The condition of the

crop was generally high in the Northcentral States, with the exception of North Dakota, though even in North Dakota it was above the ten-year average The condition in the Pacific States was considerably below the average, due to drouth, being 10 per cent below the ten-year average in California and 30 per cent below in Washington.

211-D. RICE INVESTIGATIONS.

The estimated area sown to rice in the United States in 1918, as shown by the Monthly Crop Report of the Bureau of Crop Estimates for July, is 1,120,400 acres, an increase of 16.2 per cent over that of last year. The increases were general throughout the rice growing States, being 16, 8, 18, and 35 per cent respectively in the important States of Louisiana, Texas, Arkansas, and California. Large percentage increases are shown in several of the southern States but the total acreage in these States is small.

The condition of the crop in general is slightly above the ten-year average, being reported as 91.1 per cent as compared with 88.7 per cent for the ten-year period. In Arkansas the condition is reported as 1 per cent below the ten-year average, and in California as 2 per cent below.

The forecast of production is for a crop of 43,373,000 bushels as compared with 36,278,000 bushels in 1917.

211-E. GRAIN-SORGHUM AND BROOMCORN INVESTIGATIONS.

Grain Sorghum. The report for July 1 from the Bureau of Crop Estimates places the grain sorghum acreage in six States, Kansas, Oklahoma, Texas, Colorado, New Mexico, and Arizona, at 5,114,000 acres. The acreage in these States last year was 5,153,000 acres. This shows a reduction of 39,000 acres, or less than 1 per cent, from last year.

Considering the data by States, there is a reduction of 404,000 acres in Kansas and an increase of 231,000 acres in Texas, 126,000 acres in Oklahoma, and 4,000 acres each in Colorado and New Mexico. The same acreage as last year, 60,000 acres, is reported for Arizona. The condition of the crop as reported ranges from 75 per cent in Texas to 90 per cent in Arizona.

Broomcorn. The report shows the broomcorn acreage to be 314,000 acres in five States, namely Illinois, Kansas, Oklahoma, Texas, and New Mexico, as against 299,000 acres last year. This is an increase of 15,000 acres over the last crop. The greatest change in acreage was made in Oklahoma and Texas. The acreage in Oklahoma decreased by 35,000 acres, while in Texas it was increased by 46,000 acres. Illinois has an increase in acreage of 1,000 acres, and Kansas 3,000. New Mexico reports the same acreage as last year, or 30,000 acres.

211-G. FLAX INVESTIGATIONS.

The acreage sown to flax in 1918 is estimated as 1,967,000 acres, an increase of 8.7 per cent over the acreage of 1917 and greater than any previous crop since 1913. The acreage in North Dakota is 1 per cent less than in 1917, while the 1917 acreage in South Dakota was maintained. In Minnesota there was an increase of 6 per cent and in Montana 57 per cent.

The July 1 condition was estimated as 79.8 per cent with a forecasted production of 15,792,000 bushels, almost double the very small crop of a year ago. The July 1 condition, however, is 6 points below the ten-year average of 85.8 per cent. The condition is well above the average in South Dakota and Minnesota, slightly above in North Dakota, but was only 60 per cent in Montana compared with a ten-year average condition of 90 per cent.

218-B. INVESTIGATIONS OF CEREAL RUSTS.

The Barberry Eradication Campaign.

Historical. The agitation for barberry eradication became very prevalent during the past two or three years. A great many farmers had observed the harmful effects of common barberry and began to insist that it be eradicated. The Tri-State Grain and Stock Growers' convention, held at Fargo, N.Dak., adopted resolutions both in 1916 and 1917 urging the eradication of the common barberry. The Legislature of North Dakota in 1917 passed a law providing for the eradication of all rust-bearing varieties of barberry from within the State. The Legislature of South Dakota enacted a law placing the rust-bearing varieties of barberry in the class of noxious weeds.

During the fall and early winter of 1917 the agitation for barberry eradication began to be renewed in a wider area. A campaign for the eradication of the bush was begun in the State of Minnesota and plans were made for a similar campaign in Iowa. A meeting of pathologists from North Dakota, Minnesota, Wisconsin, Iowa, and Indiana was held in Chicago in February, 1918, at which the barberry question was thoroughly discussed. As a result of the discussion a delegation was asked to proceed to Washington to take up the matter of an extensive campaign with the officials of the Department of Agriculture, who had already made tentative plans for a campaign. As a result of this conference it was decided to put on an extensive campaign in those States in which the relation of barberry to rust attacks was best known.

Area Covered in the Campaign. The campaign is being carried on in the following States: Montana, North Dakota, Minnesota, Wisconsin, Michigan, Ohio, Indiana, Illinois, Iowa, Nebraska, and South Dakota. Of these States the work is being pushed least vigorously in Ohio and Montana because the situation is not as well known in those States as in the others. Preliminary work has been started in Wyoming and Colorado in order

to determine the importance of barberry in developing and spreading black stem rust.

Preliminary steps have also been taken by the State authorities in New York looking to an eradication campaign for next year. It is quite probable that the work will be extended into New York and possibly some of the New England States.

Organization of the Work. The work is being carried on cooperatively by the Office of Cereal Investigations, Bureau of Plant Industry, and the States Relations Service. A state leader of the work has been selected in each State. The States Relations Service representatives in the States are cooperating and have, with few exceptions, rendered very valuable service. The field assistants employed by the Office of Cereal Investigations, are working directly with the State leaders.

Methods of Work. Legal authority for the eradication of barberry exists only in North Dakota, South Dakota, and Minnesota. The South Dakota law has not been enforced, leaving only two States in which there is really legal authority to compel the eradication of the bushes. Since the eradication is, therefore, purely voluntary in most of the States, the following methods of work were adopted:

1. The Governor of several States, including Nebraska, South Dakota, Iowa, Wisconsin, and Michigan designated Arbor Day as "Arbor Day and Barberry Eradication Day."

2. The State Council of Defense in practically all of the States taking an active part in the campaign issued an appeal calling on all citizens to eradicate the common barberry as a patriotic act in protecting cereal crops. The County Councils of Defense also carried on the work in the various counties in a number of States.

3. The City Councils or mayors of many cities took action compelling the eradication of all common barberries from the municipality.

4. County agents have rendered valuable work by giving the greatest publicity to the facts and by organizing the work in their respective counties.

5. Educational institutions, including colleges, high schools, city and village schools, and district schools have assisted in making barberry surveys in various places. In a number of the States the rust-bearing varieties of barberries were tagged by boy scouts or school children and the owners removed them. A few cases of over-zealousness occurred, but in the main the tag idea proved to be an excellent one and brought about unlooked-for results.

6. A great deal has had to depend upon publicity. The usual avenues of publicity have been used, including the daily press, the weekly press, agricultural college news sheets, and the farm press. The publicity campaign was put in charge of an experienced agricultural journalist and has brought excellent results.

Results. 1. Nearly everyone in the Middle West, and in a great many other sections of the country as well, has come to realize as a result of the publicity and educational campaign that common barberry is the most important factor in the life history of the black stem rust, and that the Japanese variety is harmless.

2. Public sentiment has been thoroughly aroused until there is a determination on the part of a very large number of public-spirited citizens to eradicate all common barberry. The National Nurserymen's Association adopted resolutions calling upon all their members to stop propagating and selling common barberries. Nurserymen have signed pledges not to ship common barberry into the eradication area.

3. The campaign has shown beyond question that there are many more barberries than the most rabid barberry eradication advocate ever dreamed existed. In Wisconsin about 500 clumps of bushes were dug from one 40-acre pasture. In Duluth, Minn., 2,300 bushes were destroyed. In four small towns in northern Minnesota 1,100 bushes were found. In Cedar Rapids, Iowa, 23,000 bushes were destroyed. In Michigan and northern Illinois bushes were hauled from the public parks by the wagonload.

Records show that barberries were brought in with the first settlers. Many plantings in Wisconsin, Michigan and Minnesota have been shown to be at least seventy years old, or older. This answers the argument of those who state that rust epidemics occurred before the barberry was brought into the grain-growing regions.

Barberries have begun to escape from cultivation and are wild in a number of places in Michigan, Wisconsin, Minnesota, and probably also in other States. A number of instances have occurred in which farmers in a certain area had been forced to stop growing wheat or other grains on account of heavy rust attacks. Investigation showed that this was directly traceable to barberry bushes which had escaped from cultivation and acted as centers of infection

4. It has been shown conclusively that the rust on barberry is much more prevalent and wide-spread and much more important in starting rust in the spring than has been generally acknowledged. The rust began to appear on the bushes the first week in May this year and successive infections continued to occur. By the first week in June all that was necessary to find barberry rust in Michigan, Wisconsin, northern Illinois, Minnesota, North Dakota, eastern South Dakota, Iowa, and eastern Nebraska, was to find the barberry bush. Countless numbers of spores were being produced by these bushes and this rust spread to grains and grasses near the bushes before any could be found away from them.

5. The Actual Removal of the Bushes. It is safe to say that the number of bushes removed from the various States is approximately as follows: Northern Illinois 60 per cent; Wisconsin 80 per cent; Minnesota 80 per cent; North Dakota 90 per cent; South Dakota 80 per cent; Nebraska 75 per cent; Iowa 75 per cent. These figures are conservative and it is possible that a

larger percentage of the bushes has already been removed. Enough are left, however, to make it imperative to continue the campaign as vigorously as possible. In spite of the fact that about 80 per cent of the bushes are out of Wisconsin, Minnesota, and Iowa, there is enough rust on the remaining 20 per cent to infect the entire grain-growing area of the upper Mississippi Valley.

Barberry Eradication Campaign Personnel.

Dr. E. C. Stakman, (Pathologist in Charge of Barberry Eradication), University Farm, St. Paul, Minn.
Harold Aase, Care E. M. Freeman, University Farm, St. Paul, Minn.
H. W. Anderson, University of Illinois, Urbana, Ill.
D. C. Babcock, Chio Agricultural Experiment Station, Wooster, Chio
H. D. Barker, Care E. C. Stakman, University Farm, St. Paul, Minn.
John W. Baringer, 1209 W. Springfield Ave., Urbana, Ill.
J. P. Bennett, University of Wisconsin, Madison, Wisc.
Prof. H. L. Bolley, (Leader), Agricultural College, Fargo, N.Dak.
Wallace Butler, Boerne, Texas
L. S. Cheney, Barron, Wisc.
Ray Clark, Loup City, Nebr.
Prof. G. H. Coons, (Leader), College of Agriculture, East Lansing, Mich.
J. G. Dickson, University of Wisconsin, Madison, Wisc.
James A. Faris, Care E. C. Stakman, University Farm, St. Paul, Minn.
Dr. E. M. Freeman, (Leader), University Farm, St. Paul, Minn.
G. D. George, University Farm, St. Paul, Minn.
E. M. Gilbert, University of Wisconsin, Madison, Wisc.
H. C. Gilbert, 10-11 So. 4th Ave., Minneapolis, Minn.
Prof. J. F. Groves, (Leader), Agricultural College, Laramie, Wyo.
*Agnes U. Haasl, Care E. C. Stakman, University Farm, St. Paul, Minn.
A. F. Hemenway, Care E. M. Freeman, University Farm, St. Paul, Minn.
Wright L. Hess, Care College of Agriculture, Laramie, Wyo.
J. F. Holmes, 219 So. Grant St., W. Lafayette, Ind.
R. J. Hosmer, 224 Vine St., W. Lafayette, Ind.
Prof. A. N. Hume, (Leader), Brookings, S.Dak.
Chas. W. Hungerford, (Leader), University Farm, St. Paul, Minn.
*C. C. Hunter, Care E. C. Stakman, University Farm, St. Paul, Minn.
Prof H. S. Jackson, (Leader), Purdue University, Lafayette, Ind.
Dr. A. G. Johnson, (Leader), Agricultural College, Madison, Wisc.
Robert S. Kirby, Care I. E. Melhus, Ames, Iowa.
L. J. Krakover, Brookings, S.Dak.
M. B. Kroft, 222 Marsetllar St., W. Lafayette, Ind.
Julian G. Leach, Care E. M. Freeman, University Farm, St. Paul, Minn.
*Melvin A. Leach, Care G. H. Coons, College of Agriculture, East Lansing, Mich.
W. E. Leer, 216 Waldron St., W. Lafayette, Ind.
Dr. I. E. Melhus, (Leader), Agricultural College, Ames, Iowa.
Mrs. Bessie K. Pierce, Care E. M. Freeman, University Farm, St. Paul, Minn.
B. L. Richards, University of Wisconsin, Madison, Wisc.
Laura Rischatsch, Care E. C. Stakman, University Farm, St. Paul, Minn.
Dr. A. D. Selby, (Leader), Chio Agricultural Experiment Station, Wooster, Chio.
*Lloyd A. Spencer, Care G. H. Coons, College of Agriculture, East Lansing, Mich.
R. B. Streets, Bozeman, Mont.
Dr. F. L. Stevens, (Leader), University of Illinois, Urbana, Ill.
Wilbur H. Thies, Care G. H. Coons, Agricultural College, East Lansing, Mich.
Prof. D. B. Swingle, (Leader), Agricultural College, Bozeman, Mont.
Elda Walker, University of Nebraska, Lincoln
Prof. [illegible]

Stem Rust Survey.

The stem rust survey which was begun in March, 1917, showed fairly conclusively that the severe epidemics of stem or black rust which occur in the Northern States could not very reasonably be attributed to the spread of rust from the South to the North. Although the evidence was not entirely conclusive, it was at least quite suggestive. The rust began to appear on grains and grasses near barberry almost as soon as it became at all prevalent in the South. Added to this was the fact that the rust in the Gulf States is quite different from that in the Northern States. Stem rust collected in Alabama, Louisiana, and southern Texas proved to be the tritici-compacti form which normally is incapable of attacking most of the hard winter wheats and the hard spring wheats.

The survey during 1917 showed the fact also that barberries are quite numerous and that they rusted rather commonly as far south as Nebraska and occasionally as far south as northern Kansas. Another fact which was clearly brought out was that successive infections may occur on barberries. Cluster cups were found on the bushes as late as the first week in September. While it had been known previously, of course, that a number of infections might occur on barberries in a single season, the survey brought out the fact that late infections were very common.

The work in 1917 suggested very sharply the desirability of carefully studying the methods of overwintering of the stem rust and of the leaf rust. In order to accomplish this stations were established at various places throughout the Mississippi Basin. Three men were employed early in the fall and were stationed as follows:

A. F. Thiel, St, Paul, Minnesota,
Dr. Charles Drechsler, Manhattan, Kansas,
H. D. Barker, Auburn, Alabama.

Mr. Thiel's territory included Minnesota, North and South Dakota, eastern Montana, northeastern Wyoming, Nebraska, Iowa and Wisconsin.

Dr. Drechsler's territory included Kansas, Colorado, Oklahoma, eastern Texas, western Louisiana, Arkansas and Missouri.

Mr. Barker's territory included Mississippi, Alabama, Georgia, Northwestern South Carolina, Tennessee and Kentucky.

The results of the past winter's work clearly indicate the probability that the uredinio spores of stem rust cannot survive winter conditions. The spores remained viable while they were covered with snow, but early in the spring they began to lose their viability and finally apparently lost it entirely. Thousands of spores were examined but there was no evidence whatever that any of them had retained their power of germination. Furthermore, the rust did not begin to spread from the clumps of grasses or volunteer grains on which viable spores were found during the winter. While the stem rust must have overwintered in the uredinial stage in the extreme South, it was so rare that actual demonstration of the fact could not be made.

It is still possible that overwintering in the uredinial stage may very rarely occur, but the evidence now is that it is so rare, indeed, as to be virtually negligible for practical purposes. It is very evident that in the States north of the northern boundary of Kansas the barberry is so much more important than the overwintering in the uredinial stage that the argument of overwintering loses its force entirely

218-D. INVESTIGATIONS OF CEREAL SMUTS.

The Smut Control Campaign.

The cooperative campaign for the control of cereal smuts, initiated last September and carried on during the past ten months in cooperation with the extension departments of the principal grain-growing sections of the United States, falls naturally into two separate phases, namely, field-survey work and seed-treatment demonstration work. From September, 1917, to May, 1918, about 40 men were employed in the conduct of cooperative seed-treatment demonstration work. At present 65 men are working in eight different districts of the United States, the men in each district working directly under the leadership of a squad captain, who is responsible for the making of all necessary plans and arrangements with the State Extension Director incident to routing the men and attending to the details of their cooperative relationships with the county agents.

All of the Smut Control Campaign men are now engaged in the completion of a nation-wide field survey, the purpose of which is to determine the distribution of and the damage resulting from the several cereal smuts and other easily preventable cereal diseases. Much of their work during the course of the summer has been directly concerned with checking up results of the seed-treatment work of last fall, winter, and early spring. The reports from these field men indicate an unexpected prevalence of bunt and loose smut of wheat, the smuts of oats, covered smut of barley, and the stripe disease of barley. All of these diseases are easily controlled by the use of formaldehyde. Prior to the completion of the field-survey work the squad captain will confer with the several directors of extension in those States calling for Federal aid in the conduct of a seed-treatment campaign during the coming fall and winter months. The plan is to have all arrangements incident to the conduct of the seed-treatment campaign in any given State made in conference between the Federal representative (in this case, squad leader), director of extension, State or extension pathologist, and, if possible, county agent leader or any others directly concerned.

The survey work will be completed by August 10 in practically all of the Northern States. Plans are already being made preparatory to starting the fall seed-treatment work in certain of the Middle Western States and in the three Pacific Coast States. It is hoped that by conducting seed-treatment demonstrations before farmers' organizations, rural schools, movable schools, county and State fairs, county agents' meetings, and rural conventions of one sort or other a practical working knowledge of seed treatment for the prevention of these diseases may become widespread.

Bulletins, circulars, seed-treatment cards, etc., will be distributed as desired to the farmers through the Extension Department of each State. Posters, handbills, circulars, or other published matter of a strictly local significance will be published by the State, following a joint arrangement made between the Federal smut squad leader and the Director of Extension. In some instances the squad leaders have been supplied with lantern slides illustrating the different smuts and approved methods of control. It is the plan to prepare additional sets of lantern slides for use in connection with lectures and seed-treatment demonstrations to be carried on this fall and winter. In those States where spring grains are grown the men will, on completion of the seed-treatment campaign in the Southern States, return to conduct seed-treatment demonstrations from about February 1 to April 15. All of this work is carried on in cooperation with the State extension service throughout the country. By effective, concerted action this work should result in the saving of at least 10,000,000 bushels of wheat, 30,000,000 bushels of oats, and 5,000,000 bushels of barley and rye.

Smut Control Campaign Personnel

Eastern District. (Maine, Vermont, New Hampshire, New York, Massachusetts, Connecticut, Rhode Island, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, West Virginia, North Carolina, Georgia, South Carolina)

Leader: Dr. Duncan S. Johnson, Johns-Hopkins University, Baltimore, Md.

F. F. Blaine
J. H. Clark
J. C. Fischer
C. Gregory
H. E. Huber
H. L. Lewis
H. K. Vance
C. P. Winn
W. W. Wood

Ohio Leader: W. G. Stover, Ohio State University, Columbus, Ohio.

East Central District (Michigan, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi, Alabama).

Leader: R. J. Morgan,

G. R. Bridgeforth
E. C. Dobbs
J. T. Fowler
G. H. Gillespie
F. R. Heath
Leroy Hoffman
H. C. Jacobs
S. L. Miner
G. E. Paxton
E. J. Petry
N. D. Ricks
Wm. R. Taylor
A. E. Waller

West Central District (Minnesota, Iowa, Missouri, Arkansas, Louisiana).

Leader: George M. Reed, College of Agriculture, Columbia, Mo.

A. L. Bakke
H. A. Borthwick
K. M. Fradenburg
M. C. Gillis
R. A. Langenbacher
A. W. Monosmith
H. H. Plagge
C. M. Tucker

Great Plains District (North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Wyoming, Colorado, New Mexico).

Leader: Charles S. Reddy.

J. H. Brown	J. Godkin	C. M. Scherer
R. A. Carrol	G. W. Martin	W. P.Sinnock*
C. J. T. Doryland	W. P. Nemsick*	V. F. Tapke
A. T. Evans	W. F. Reddy	

Washington

Leader: George L. Zundel, Pullman, Wash.

J. G. Barnes*	G. H. Jensen
Agnes Carlson	F. J. Stevenson
H. Coleman*	J. L. Thompson
Marian Griffiths	H. Williams*

Oregon-Idaho

Leader: H. M. Woolman, Corvallis, Oreg.

J. C. Bell	Jessie P. Rose
Alva Breithaupt	H. C. Woodham
G. R. Kerns	J. A. Young

California

Leader: William W. Mackie, 121 Hilgard Hall, Berkeley, Cal.

Anna E. Ehlers
C. W. Johnson
H. J. Stevens
A. C. Wilcox

* Appointment pending.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10 July 31, 1918. No. 10

Miscellaneous Issue

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OFFICE ACTIVITIES

PERSONNEL

Harold Aase, Field Assistant in the Barberry Eradication Campaign in Minnesota, has resigned from the service, effective July 16, to enter military service.

C. R. Ball attended the conference which was held in Chicago on July 25 for the purpose of placing before the State agricultural extension officials of the wheat-growing States in the Upper Mississippi Valley the program of the Department of Agriculture for winter wheat acreage in 1918.

John G. Barnes has been appointed Field Assistant, effective July 17, and is assisting Mr. George L. Zundel, Smut Control Campaign leader in the State of Washington. Mr. Barnes has completed three years at the Washington State College and has had wide practical experience in farming.

Victor H. Florell of the Plant Introduction Garden, Chico, Cal., left Chico on July 16 for Corvallis, Oreg., where he will spend about two weeks supervising the harvesting and thrashing of the spring cereals and compiling data on the results of experiments. He will then proceed to Moro, Oreg., to take charge of the harvesting and thrashing of the classification and breeding nurseries at that point.

C. C. Hunter has received appointment as Field Assistant, effective July 17, and has been assigned to the Barberry Eradication Campaign in Minnesota. He is a graduate of the Minnesota College of Agriculture and has had many years experience in the nursery business and similar work.

Dr. Duncan S. Johnson, leader of the Smut Control Campaign in the Eastern district, returned to Washington on July 31, for conference, after which he will resume his work in the New England States.

E. S. Landry, Field Assistant at the Crowley Rice Station, Crowley, La., has resigned from the service, effective July 31, to enter military service.

Dr. C. E. Leighty left the Cornell Experiment Station, where he has been studying the wheat in the cooperative experiments, on July 24, to attend the wheat acreage conference at Chicago on July 25, and returned to Washington on July 26.

Jessie P. Rose has been appointed Field Assistant, effective July 17, and is engaged in laboratory work at Corvallis, Oreg., in connection with the Smut Control Campaign in Oregon. Miss Rose will test treated seed for injury, will test fungicides, etc., and make analyses of smut and dust collected by smut and dust collecting fans in northeastern Oregon. She is a graduate of the Oregon State Normal School and Leland Stanford University.

Wilbur H. Thies, Field Assistant on the Barberry Eradication Campaign in Michigan, has been called into military service, and reported at Camp Custer, Michigan, on July 24. His address is 11th Company, 160th Depot Brigade, Camp Custer, Mich.

At the third annual conference of western agronomists which was held at Corvallis, Oreg., on July 18-20, inclusive, our office was represented by the following men:

L. C. Aicher, Superintendent of the Aberdeen Substation, Aberdeen, Idaho,
A. F. Bracken, Superintendent of the Nephi Substation, Nephi, Utah,
J. A. Clark, in charge of Western Wheat Investigations,
V. H. Florell, Plant Introduction Garden, Chico, Cal.,
J. H. Martin, Superintendent of the Harney County Dry-Farming Substation, Burns, Oreg.
D. E. Stephens, Superintendent of the Sherman County Branch Station, Moro, Oreg.
H. M. Woolman, leader in Oregon of the Smut Control Campaign.

Mr. D. E. Stephens addressed the conference on the subject of "Row versus Plat Sowing for Varietal Tests" and Mr. J. A. Clark spoke on "Classification of American Wheats." Mr. Jenkin W. Jones of the Biggs Rice Field Station, Biggs, Cal., and Mr. M. A. McCall of Adams Branch Experiment Station, Lind, Wash., were unable to attend, due to pressing station duties.

VISITORS.

Lieut. A. D. Ellison, formerly of this office, who is now serving in the Gas Defense branch of the Engineer Corps, was an office visitor on July 30. He had received orders to proceed on July 31 to Camp Funston, Kansas.

T. V. Ellzey, of Canadian, Texas, Secretary-Treasurer of The Panhandle Food and Feed Production Campaign, an organization of the cattlemen in the Panhandle of Texas, visited the office on July 27 in the interests of greater wheat production.

PUBLICATIONS.

First page proof of Department Bulletin No. 698, entitled "Grain-Sorghum Experiments in the Panhandle of Texas," by C. R. Ball and B. E. Rothgeb, was read on July 24.

Circular No. 114, Office of the Secretary, entitled "A Serious Eelworm or Nematode Disease of Wheat," by L. P. Byars of Cotton, Truck and Forage Crop Disease Investigations, was published on July 26, 1918, as a contribution from the Office of Cereal Investigations.

ADDITIONAL FISCAL INSTRUCTIONS FOR FIELD MEN.

Since preparing the special memorandum of July 3, entitled "Instructions to New Appointees," it has become necessary to call attention to additional items misunderstood or neglected. Please give careful attention to the ones noted below. These and others will be included in a revised edition of the instructions at a later date.

OFFICIAL STATION.

Your official station or permanent headquarters is named in your authorization. It is the place where you make your headquarters and to which you return after a field trip. You will not be reimbursed for expenses for meals, lodging, nor laundry at your official station, not even for the laundering of clothing worn during an official trip. You are entitled to carfare or cabfare to and from the railroad station at your official station at the beginning and end of an official trip. You may purchase supplies at your official station if your authorization permits the purchase of supplies anywhere. In your reimbursement account for traveling expenses (Form 4 voucher) you must show the hour of leaving and returning to your official station each time you begin or end a trip there.

LEAVE, OR ABSENCE FROM DUTY.

Some field employees may be allowed a certain amount of annual leave with pay. Those who are paid by the day and those whose appointment is temporary and not pending certification from a Civil Service examination, are not allowed leave with pay. Those who are appointed from Civil Service registers, or whose appointments are made pending a Civil Service examination which has been or is to be taken, may be allowed annual leave with pay at the rate of 1.25 days per month from date of appointment. This totals 15 days in a full calendar year. This leave, if not used, accumulates until December 31, when it is cancelled automatically.

If you are obliged to be absent from your work, you must fill and sign a leave slip for the days desired and send it to this office. If you are entitled to leave with pay it should be indicated as annual leave. If you are not entitled to leave with pay it should be indicated as leave without pay. If in doubt, sign the slip and it will be completed here. All employees not entitled to leave with pay must prepare and sign in advance a slip for leave without pay for the time they wish to be absent from duty. Without such leave slips, no salary will be paid to any employee for the balance of the month in which the leave was taken.

Employees who wish to take leave en route while traveling and away from their official stations must plan for it and apply for it long enough in advance to have permission for such leave included in their authorization. When leave has been taken, either en route or at official station, no expenses will be reimbursed until some official business has been done after the expiration of the leave. For instance, if you have taken leave on a certain day you cannot claim reimbursement for expenses for lodging on the night of that day unless you can show (1) that you performed during the evening some official business, such as writing letters, notes or reports, conferences with officials, planning routes, or some similar work; or (2) that you have resumed your official journey. Reimbursement vouchers must show date and hour of beginning leave, and date and hour of returning to duty.

STATE NAMES OMITTED

The name of the State must be given with the name of the town in every case. This applies to reimbursement accounts naming towns where expenses were incurred, and also to subvouchers, itinerary reports, transportation requests and all other documents. Some field men have omitted State names entirely.

DEPARTMENTAL AND BUREAU MEMORANDA.

NO. 243. INFORMATION REQUIRED IN REQUESTING TEMPORARY APPOINTMENTS. July 5, 1918.

To facilitate the handling of temporary appointments, the Civil Service Commission has asked that the Department furnish the following information in requesting authority for such appointments, or extensions thereof, and in reporting temporary appointments made under authority already granted:

1. Whether the person concerned has taken or applied for a Civil Service Examination which, in the opinion of the recommending officer, makes him eligible for the position to which his appointment has been made or proposed.

2. The title of the examination taken or applied for.

3. The place where the examination was or is to be taken,

4. Date of examination.

5. Average attained.

In order that the Department may comply with the wishes of the Commission, this information should be embodied in all future recommendations for temporary appointments.

The Commission also requests that no person be appointed temporarily unless he or she meets the requirements for entrance to the examination for the position. This applies also to reappointments pending certification.

All bureaus, divisions, independent offices and boards of the Department are requested to issue appropriate instructions to their appointing officers in order that these conditions may be met in future recommendations.

Clarence Ousley,
Acting Secretary.

NO. 244. PUBLICATION AND MOTION PICTURE ACTIVITIES OF THE DEPARTMENT. July 15, 1918.

By direction of the Secretary the following changes are made in the publication work of the Department, effective July 1:

1. Mr. Joseph A. Arnold has been transferred from the Office of Chief of the Division of Publications to my office as Special Assistant. Mr. Arnold's chief responsibility will be to give dispatch to emergency publications under the Food Production Act. At the same time he will be available for assistance in connection with special distribution problems or activities in any of the bureaus or divisions.

2. Mr. E. B. Reid has been appointed Chief of the Division of Publications and will act as my immediate assistant in the administration of all the publication and motion picture activities of the Department, which include the following:

(a) Information. Mr. Harlan D. Smith has been appointed to succeed Mr. George W. Wharton as assistant in Charge of the Office of Information.

(b) Editorial. Mr. Reid, in addition to his new duties, will continue for the time being to immediately supervise the work of reading manuscripts, with the advice and assistance of the Committee on Manuscripts.

(c) Distribution. Mr. Francis J. P. Cleary, who for the past two or three months has been acting as Chief of the Division of Publications has been appointed Superintendent of Distribution in immediate charge of the distribution activities in the Division of Publications.

(d) Motion Pictures. Mr. D. C. Ellis, Spedial Assistant, will continue in charge of motion picture activities.

During the last few months we have made notable progress in the preparation of more attractive publications and the issue of seasonal and acceptable information. Also we have taken up much lost motion, but I think much more remains to be done to that end in order that we may avoid waste, shorten the time between the preparation of the manuscript and its delivery to the reader, and effect a more intelligent and economical distribution of our publications. The new plan of organization, as outlined herein, will place the publication activities of the Department on a more stable and definite basis and will facilitate the administration of this important branch of the Department's work. I am sure that we shall receive your hearty cooperation and assistance in this matter.

Very truly yours,
Clarence Ousley,
Assistant Secretary.

LETTERS TRANSMITTING LISTS OF FIRMS.

Memorandum For Heads of Offices. July 9, 1918.

Gentlemen:

We are frequently requested by farmers and others to furnish lists of business concerns, such as seed dealers, nurserymen, manufacturers of farm implements and other equipment required for use on farms, orchards and gardens. Adequate service to the public requires the furnishing of information in response to such requests where this is possible.

To avoid misapprehension by the public as to the exact significance of such information, any such lists, whether written in the body of a letter or forwarded as an enclosure, should make clear that the addresses are furnished merely as information, and that this does not imply any recommendation of the firms or their wares or any guaranty of their business standing or financial responsibility, by the Department. Please bring this to the attention of all members of your force who prepare correspondence involving the furnishing of such information.

Very truly yours,
Wm. A. Taylor, Chief of Bureau.

It is suggested that the following paragraph be inserted hereafter in all letters giving the names of commercial firms of any sort:

"These names are furnished merely as a matter of information. Please understand that this does not imply any recommendation, by the Department, of the firms, or their wares, or any guaranty of their business standing or financial responsibility."

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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. August 10, 1918. No. 11.
Field Station Issue

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OFFICE ACTIVITIES

PERSONNEL

Cereal Agronomic Investigations.

A. F. Bracken, Superintendent of the Nephi Substation, Nephi, Utah, writes that owing to the pressure of station work he did not plan to attend the Western Agronomic Conference at Corvallis, Oreg., on July 18 to 20. His wife, however, insisted that he should go and he is glad she did because he would not have missed the experience for anything.

C. H. Clark, in charge of Flax Investigations, after studying his breeding nursery at the Northern Great Plains Field Station, Mandan, N.Dak., went to Minneapolis and Duluth in the interest of utilization of flax products and then proceeded to the investigation of flax production in Montana. He will reach Bozeman, Mont., on August 11.

J. A. Clark, in charge of Western Wheat Investigations, has completed his work in the Pacific Northwest and is now visiting the field stations in the northern half of the Great Plains area. He will be at Moccasin, Mont., on August 12, and will proceed from there to inspect fields of winter wheat in Big Horn County, Mont. He will then visit field stations in Wyoming and South Dakota.

William C. Eldridge, who has had charge of the cereal experiments at Arlington Farm, Va., during this summer, resigned on August 6 to enter the Officers' Training Camp at Plattsburg, N.Y.

Dr. H. V. Harlan, in charge of Barley Investigations, has completed the study and harvesting of his breeding nursery of barley at the Aberdeen Substation, Aberdeen, Idaho, and has since visited the stations at Moccasin, Mont., and Mandan, N.Dak. He will reach the University Farm, St. Paul, Minn., about August 11 and will return to Washington about August 20.

F. A. Kiene, Jr., Agronomist in Charge of the Cereal Investigations at the Hays Branch Station, Hays, Kans., has been detailed to assist Mr. L. M. Estabrook who will advise with the Federal land banks in making loans from the fund of five million dollars made available by President Wilson to supply seed wheat and rye for fall sowing in the drought-stricken portions of Kansas, Oklahoma, and Texas.

M. N. Pope, Assistant in Barley Investigations, who has been with Dr. Harlan at the Aberdeen Substation, Aberdeen, Idaho, in harvesting and recording the barley nursery, will proceed to the University Farm, St. Paul, Minn., about August 10, where he will begin the study of the barleys in the breeding nursery at that point.

John F. Ross, Superintendent of the Amarillo Cereal Field Station, Amarillo, Texas, has been detailed to assist Mr. L. M. Estabrook who will advise with the Federal land banks in making loans from the fund of five million dollars made available by President Wilson to supply seed wheat and rye for fall sowing in the drought-stricken portions of Kansas, Oklahoma, and Texas. With Mr. Kiene he will report at Manhattan, Kans., for conference on Monday, August 12, and at Wichita, Kans., for conference on August 15.

B. E. Rothgeb, in charge of Grain-Sorghum and Broomcorn Investigations, left Washington on August 7 for points in Texas and Oklahoma to study the production of these crops. He expects to reach the Cereal Field Station at Amarillo on August 25.

C. W. Warburton, in charge of Oat Investigations, left Washington on August 6 for North Dakota and Montana to assist Professor G. I. Christie who will advise with the Federal land banks in making loans from the fund of five million dollars made available by President Wilson to supply seed wheat and rye for sowing this fall in the drought-stricken portions of those States. He will stop at Minneapolis and Fargo en route and will attend the initial conferences at Bozeman, Mont., on Sunday, August 11, and Helena, Mont., on Monday, August 12. Thereafter his address will be Hotel Rainbow, Great Falls, Montana.

Cereal Disease Investigations.

F. F. Blaine, Field Assistant in the Smut Control Campaign in the Eastern district, returned to the office on August 2, and is now engaged in making arrangements with the State Extension Departments in the Eastern States for seed treatment work to be done next fall.

H. A. Borthwick, Field Assistant in the Smut Control Campaign in the West Central district, arrived at the office on August 3 and is now engaged with Mr. K. M. Fradenburg in compiling the results of the smut survey in the West Central States for distribution in these States.

J. H. Clark, Field Assistant in the Smut Control Campaign in the Eastern district, was in Washington on August 3 for conference with regard to the control of the nematode disease of wheat.

Hugh Coleman was appointed Assistant Pathologist on July 22 to assist in the Smut Control Campaign in Washington. Mr. Coleman received his education at Washington State College and has taught cereal pathology there for one year.

Glenn M. DeGroft was appointed Field Assistant on July 27, and will assist in the Barberry Eradication Campaign in Minnesota, Wisconsin, Iowa, Nebraska, South Dakota, and North Dakota. Mr. DeGroft received his education at Ohio Northern University and has worked there for one year as assistant in the Botanical Laboratory.

S. M. Dietz, Field Assistant, who has been assisting in the investigation of the crown rust of oats conducted in cooperation with the Iowa State Experiment Station, has been called for military service. His resignation took effect July 27.

J. C. Fischer, Field Assistant in the Smut Control Campaign in the Eastern district, was in Washington on August 3 for conference with regard to the control of the nematode disease of wheat.

K. M. Fradenburg, Field Assistant in the Smut Control Campaign in the West Central district, arrived at the office on August 6 for the purpose of compiling the results of the smut survey in the West Central States for distribution in these States. He is now engaged with Mr. H. A. Borthwick in this work.

Laurenz Greene has been appointed Field Assistant, effective July 22, to assist in corn disease investigations, with headquarters at Purdue University, Lafayette, Ind. Mr. Greene is a graduate of the Kansas State College and received his M.S.A. degree at Iowa State College. He has been connected with the Iowa State Experiment Station for some years and has been chief of the Horticultural Division of Purdue University since September, 1917.

Joseph M. Guerretaz was appointed Assistant Pathologist on August 1, to work in the Smut Control Campaign in Washington. Mr. Guerretaz received his education at Valparaiso College in Indiana and at Washington State College, and has had training and practical work in botany.

Leroy Hoffman, Field Assistant in the Smut Control Campaign in the East Central district, was in Washington from August 1 to 3 for conference. He will succeed Mr. R. J. Morgan as leader of the Smut Control work in the East Central district after August 15.

J. F. Holmes, Field Assistant in the Barberry Eradication Campaign, has been called for military service. His resignation took effect June 30.

R. J. Hosmer, Field Assistant in the Barberry Eradication Campaign, resigned from the service on June 30, when he was called into military service.

Melvin A. Leach, has been appointed Assistant Pathologist, effective July 20, and will work in the Barberry Eradication Campaign in Michigan. He is a graduate of the Michigan Agricultural College, and has had experience as farmer, teacher of botany, and county agriculturist.

R. J. Morgan, Leader of the Smut Control Campaign in the East Central district, returned to Washington on August 1 for conference before giving up this work to enter the Central Officers' Artillery Training School, at Camp Taylor, Louisville, Ky., which opens August 15. Mr. Morgan left Washington on August 3 to continue his smut control work until August 15.

Dr. George M. Reed, Leader of the Smut Control Campaign in the West Central district, was in Washington August 2 and 3 for conference.

R. B. Streets, Assistant Patholcgist in the Barberry Eradication Campaign in Montana, has been called for military service. His resignation took effect July 20.

Wm. Randolph Taylor, Assistant Pathologist in the Smut Control Campaign, has been transferred from work in the East Central district to the Eastern district under the leadership of Dr. Duncan S. Johnson.

Florence S. Willey has been appointed Assistant Pathologist, effective July 22, to assist in the Barberry Eradication Campaign in Iowa. Her duties will be confined largely to laboratory work, making analyses of specimens of rusts, etc., collected by the field men. Miss Willey is a graduate of the Iowa State College, where she received also the degree of M.S. She has taught botany in high school and was Laboratory Assistant at the Iowa State College for a year and a half.

Hill Williams has received appointment as Field Assistant, effective July 22, and will assist in the Smut Control Campaign in Washington. He is a graduate of the Washington State College and has had considerable experience in growing and handling cereals.

Harry C. Woodham has been appointed Field Assistant, effective July 16, and will assist in the Smut Control Campaign in Oregon. He has had considerable experience as instructor in botany and agriculture in high school and college and is acquainted with conditions in Oregon and Washington, which should make his services of much value to the smut control work.

VISITORS.

Mr. A. M. Ferguson, of Ferguson Seed Farms, Sherman, Texas, who has been cooperating with this office in experiments with oat varieties at that point, was a visitor on August 7. He was accompanied by Mr. C. E. Schuster, Secretary-Treasurer of the Lone Star Cotton Seed Company, Waxa hachie, Texas.

FIELD STATION CONDITION AND PROGRESS, JULY, 1918.

HUMID EASTERN STATES.

LOUISIANA.

Crowley Rice Station, Crowley. (J. Mitchell Jenkins) The weather during the first part of July was very dry. Small rains which occurred on the 1st and 12th were helpful to cultivated crops but of little value to rice. The precipitation on the 12th enabled us to prepare land and seed soy beans. On the 19th a general rainfall of 2.07 inches occurred, which was of great value to the rice industry. It was not sufficient to noticeably affect the salt situation in the streams but rendered service in the fields.

GEORGIA.

State Experiment Station (Athens) and Substations. (Loy E. Rast) The thrashing for this season is now completed and we are determining the yield per acre in bushels , as well as other necessary data.

Our varietal experiments with wheat show the following yields from some of the best producing varieties: Fulcaster 66.6 bushels; Bluestem 65 bushels; Georgia Red 55 bushels, with native grown unimproved seed of the same variety producing 38.33 bushels; Leap's Prolific 46.6 bushels, and Bearded Purplestraw 45 bushels. These were all grown on hundredth acre plats and figured 60 lbs. per bushel, whereas our wheat ordinarily runs from 59 to 62 pounds. Our yields of wheat both at this place and in the southern part of the State are somewhat better than usual. This increased yield can not be due entirely to seasonal conditions, since there is no doubt that the selection and introduction of promising strains has had a wonderful influence.

The yields of wheat in duplicate plats with different rates of seeding are given below.

Name	Rate Pecks	Yield per acre Bushels.	Average
Georgia Red	2	33.8	
		35.8	34.8
do	3	38.3	
		36.6	37.5
do	4	41.6	
		39.2	40.4
do	6	43.3	
		40.0	41.6
do	8	45.0	
		35.0	40.0
Fulcaster	2	29.5	
		35.0	32.2
do	3	37.9	
		33.4	35.6
do	4	35.0	
		35.3	35.1
do	6	39.1	
		38.3	38.7
do	8	43.3	
		35.0	39.1

The better yields obtained with the largest quantity of seed sown is due to the fact that all of our small grain was severely injured by the hard freezes last winter and, of course, the higher percentage of plants remained where the seed was thickest.

The results of the varietal experiment with abruzzes, South Georgia, and Virginia Rye, seeded three pecks per acre in duplicate plats, are as follows:

Name	Yield per Acre Bushels	Average
Abruzzes	50.0	
do	36.0	43.0
South Georgia	36.6	
do	33.3	35.0
Virginia	38.3	
	36.3	37.3

Following are the results from the three highest yielding varieties of barley in duplicate plats in the varietal experiment:

Name	Yield per Acre Bushels	Average
Tennessee Winter	72.4	
	68.6	70.5
Wisconsin Winter	50.0	
	62.5	56.2
Turkestan	43.8	
	66.6	55.2

NORTH CAROLINA.

West Raleigh. (Gardner M. Garren) All the wheat and oats grown during the past season in the cooperative experimental plats have been harvested and the data tabulated. The annual report is now being prepared.

The farmers throughout the principal wheat-growing section of the State have, with a few possible exceptions, finished thrashing. The yields, while a keen disappointment from the anticipated yields of the early summer, were better than estimated at harvest time. It was the prospect about May 1 to 10 of a bumper crop and the later disappointing actual yields that discouraged the farmers and gave credence to the popular estimate that the wheat yield this season in North Carolina is abnormally low. Perhaps the yield is not more than 50 per cent of that indicated by the early prospects but it is at least 85 or 90 per cent of a normal crop. This statement is based on a comparison of the average acre yields in the variety experiments on the Piedmont Branch Station for the past nine years, 1910 to 1918 inclusive, and the yields for the present season in the same experiments. Leap's Prolific, the leading variety for yield on this farm, has an average yield for the nine years of 18.1 bushels; a yield this season of 15.5 bushels or 85.6 per cent of the normal. Fulcaster, the second leading variety, has an average yield of 17.9 bushels; a yield this season of 13.6 bushels or 75.9 per cent of the normal.

Fultz, the third leading variety, has a yield this season that is 109 per cent of the normal. Dietz Mediterranean, the next in order, produced this season 92.4 per cent of the normal.

The disappointment of the farmers in the yields realized was caused by a continued hot dry period that prevailed during the early formative period of the wheat berry. May 10 was the time at which the wheat prospects were most promising on the branch station farm and the harvesting on this farm was done around June 10. These dates doubtless apply on the average to conditions and time of harvesting throughout that portion of the State. The mean maximum and minimum temperatures recorded at the Piedmont Branch Station from May 10 to June 5, the ripening period of the wheat, were 87.7 and 63.1 respectively. The highest temperature for this period was 99° on June 1 and the lowest 45° on May 20. The total precipitation for this period was 1.51 inches, 1.16 inches of which fell on May 14. The rainfall was very low for that portion of North Carolina, and together with the unusually high temperatures made a weather condition that simply dried up the wheat and did not allow it to ripen in the natural way, hence the shortage in wheat yields. This weather condition prevailed over practically the entire State during this period.

VIRGINIA.

Arlington Farm, Rosslyn. (Wm. C. Eldridge) Thrashing has been completed and cleaning of the grain begun. Crops have been generally very good this year. Yields of the nursery-grown grain are being determined and seed is being prepared for sowing next fall.

The resignation of Mr. Eldridge who has had charge of the cereal experiments this season is noted under personnel items.

NEW YORK.

Cornell Experiment Station, Itaca. (H. H. Love) No report of the cooperative work at this station for the month of July has been received. The following are observations by Dr. Leighty, Agronomist in charge of Eastern Wheat Investigations, during his trip in New York State in July:

As a result of the cooperative work in cereal breeding carried on by the Bureau of Plant Industry and the New York State College of Agriculture at Cornell University, several strains of oats and wheat have been developed which are giving good results in experiments made in several parts of the State. Many comparative tests have shown these selected strains to be superior to ordinary varieties being grown by the farmers on whose places the tests were made. As a result of these demonstrations, a few of the varieties, especially of the oats, have been rather widely distributed in the State and are being grown on large acreages.

A great many small patches of spring wheat were sown this year in New York State. In the course of a trip from Binghamton to Schenectady very many of these small sowings were seen. They were usually of one to two acres each, but were occasionally somewhat larger. Farmers, county

agents and others uniformly reported that much more spring wheat than usual had been sown this year. Many of these fields were examined within three or four weeks of harvest. At that stage they gave every promise of returning excellent yields. If weather conditions are favorable until harvest time excellent yields will doubtless be obtained on practically all of them. All fields examined appeared to be nearly pure Marquis spring wheat. In most cases less than one per cent mixture of other varieties could be observed. In the northern part of the State the acreage of spring wheat this year is reported to be much larger than in the southern part.

The winter wheat in New York State was rather badly injured last winter. It is estimated that 15 per cent of the acreage sown was abandoned. Most of the fields left for harvest have suffered more or less from winter-killing. As a result of this there were thin patches in nearly every field. In these thin patches quack grass and timothy usually grew up and the ripening of the grain was delayed. It has been a somewhat difficult matter to harvest such fields. Many farmers were in doubt as to when to do their harvesting, as the wheat where the stand was perfect was fully ripe a week or more before that where the stand was thin

The wheat midge is apparently distributed widely in the State and will do some damage. It was not observed anywhere in numbers sufficient to be at all aalarming.

MISSOURI

State Experiment Station, Columbia. (No report received.)

IOWA.

State Experiment Station, Ames. All of our plats have been cut and are now ready for thrashing. We completed cutting all varieties except the White Russian oats on July 20. The side oats were cut on July 27.

The shortage of feed in the community has caused early thrashing this season and the yields of oats per acre are reported to run from 50 to 70 bushels.

GREAT PLAINS AREA.

TEXAS.

Amarillo Cereal Field Station, Amarillo. (John F. Ross)

The weather data for the month of July are as follows: Maximum temperature 100° on July 10 and 11, minimum 60° on July 11; average hourly wind velocity 8.4 miles; precipitation 2.69 inches, most of which fell in showers too small to be of benefit. The only showers of much value were .84 of an inch on the 15th, .51 of an inch on the 16th, and .45 of an inch on the 30th.

Crops have made some growth during the month but it has been very slow, spasmodic and uncertain. The pasture grasses have been able to make better use of the small showers than the field crops and therefore are in fairly good condition.

The small grain thrashing lasted about four hours this year. The yields varied from ½ to 10½ bushels. The latter yield was secured from a plat that had the advantage of runoff from some other plats last fall.

Mr. L. N. Jensen, representative of the Office of Dry Land Agriculture at this station, has been transferred to Big Springs, Texas, to take charge of that farm for the D.L.A. office. He left here on July 28.

OKLAHOMA.

Woodward Field Station, Woodward. (John B. Sieglinger)

July has been a rather hot and dry month even for western Oklahoma. The maximum temperature for the month was 102° on July 7 and 15. The minimum temperature was 59° on July 1. The precipitation was as follows: .07, .04, .02, .51, .04, and .04 inches on July 2, 10, 15, 16, 22 and 23, respectively, or a total of .72 of an inch for July. The 10-year average rainfall for July (1908-1917 inclusive) is 2.25 inches.

On July 24 the Sudan plats in rows and close drilled and the millet plats were mowed. The yields of hay were at the rates of 2700 lbs., 2050 lbs., and 2000 lbs., per acre, respectively. On July 25 the first and second date-of-seeding plats of red amber sorgo were harvested in the hard dough stage. They were weighed green to obtain the probable yield of silage, the yields being at the rates of 7428 lbs. and 6786 lbs. to the acre, respectively. The forage was shocked and air-dry weights will be taken later.

Sparrows from town are bothering the freed sorgo and to a less extent feterita. We are shooting all of the sparrows we can but there are plenty left.

The work for the month has been hoeing weeds, counting stands, bagging heads, taking notes, and harvesting.

Though very dry, the sorghums and broomcorn are holding their own surprisingly well.

KANSAS.

Fort Hays Branch Station, Hays. (F. A. Kiene, Jr.)

Harvesting and thrashing are completed, all seed bed preparation finished, and grains cleaned and graded. The yields of wheat were higher than we expected. About a half-acre included in some chemical experiments yielded at the rate of 19 bushels to the acre. The weight per bushel was only about 52 lbs., however.

On July 16 and 17 Mr. Kiene took a trip through Gove County and reports that the 1918 crop of wheat there practically is a failure. No wheat will be shipped from the county. Not enough seed wheat will be raised in the county to seed ten per cent of the 1918 acreage.

COLORADO.

Akron Experiment Farm, Akron. (F. A. Coffman) The weather conditions during July were exceptionally favorable in northeastern Colorado. The total precipitation at Akron for the month was 3.10 inches, which is nearly one-half inch above the 14-year average for the month of

July. The largest precipitations were .49, .87, .81, and .33 inches, which fell July 8, 16, 21, and 30, respectively. The highest maximum temperature in the month was 99° on July 3, while the minimum for the month was 49° on July 1. Very little damage was done by either wind or hail in this section during July.

Harvest of the Cereal Investigation field and nursery increase plats at Akron started July 3, and the last plats were cut July 29. The yields of practically all varieties of winter wheat and most varieties of spring wheat will average higher than those of last season. The yields of the early oat varieties and those of barley will probably be less than in 1917, while the later varieties of oats very probably will yield about the same as they did last year. The straw yields in all plats of spring grain will be considerably exaggerated, due to the large number of Russian thistles in the plats. Considerable mixture appeared in the spring plats and it was necessary to rogue the plats before harvesting.

Thrashing of our winter wheat started July 30. A plat of one-half acre of Kanred, C.I.No.5146, yielded about 11 bushels. Some of the Kanred varietal plats produced acre averages as high as 24.4 bushels. The plats of this variety on fallow averaged 22.4 bushels per acre while the corn-stubble plats yielded 18 bushels.

Harvest of the winter nursery rows was completed July 26. A few selections of Ghirka, C.I.No.1438 appear to be promising. Several other selections apparently are worthy of consideration. Not all of the nursery rows of spring grain have been harvested, because the later selections of spring wheat are not yet fully matured.

The plats of proso and millet were so completely taken by the weeds that it was necessary to turn the weeds under. The plats were reseeded July 20, and fair stands were secured in all plats. The plats of grain sorghum, planted from selections made from last season's field plats, are growing well. The plats are nearly fully headed. The corn in the ear-row test is now fully tasseled and in some of the rows the ears are past the silk stage.

Mr. T. R. Stanton, Assistant in Oat Investigations, arrived at Akron July 25 and spent the day inspecting the oat experiments and in making plans and suggestions for future work.

A picnic was held at the station on July 27 by the Federal Farm Loan Association. About 500 people visited the station during the day.

Harvest in eastern Colorado was completed from July 20 to 25. The winter wheat yields were much below early spring estimates, but a larger crop was harvested than was expected June 30. The grain is not of very good quality, due to premature ripening. All spring small grains were practically a failure in this part of the country. Most of the fields were not harvested, but were cut for feed, the prospects not warranting the expense of harvesting.

The combination harvester and thrasher is gaining some favor in this section of the country. This is partly due to the acute labor shortage. One farmer, with his wife to run the engine, harvested and thrashed some 500 acres of wheat.

The prospects for corn were excellent in northeastern Colorado on July 31. An excellent crop of corn was produced in this section last season but the prospects are even brighter this year than they were last season at this time. The corn in most fields is tasseled and is now in the silk stage

Potatoes in many fields are large enough for use. Considerable damage has been done in some localities by the Colorado potato beetle. Sorghum crops and Sudan grass are in excellent growing condition. Many fields of sorghum already are fully headed. Prospects are for a good crop of pinto beans. The beans in many fields have started to vine and will soon be in full bloom. Pastures are in excellent condition since the rains this month.

WYOMING.

Cheyenne Experiment Farm, Archer. (A. L. Nelson) The station has been without a representative of the Office of Cereal Investigations since May 11 until July 18 when Mr. Nelson took charge of the work there. No report of the station work for July has been received but Mr. J. A. Clark writes as follows on July 27 while visiting Archer: "The crops are the best I have seen this summer. Winter wheat on fallow should yield 40 bushels. With good weather for two weeks, spring wheat should go from 20 to 30 bushels. Oats and barley are equally good.

SOUTH DAKOTA. (Manley Champlin)

General. Crops in general throughout the State are above normal. A few isolated localities have suffered from drought and others from hail, but as a whole the conditions are favorable. Rains of the past week will be of great benefit to the corn and potato crops. Stands of corn are excellent, probably due to the large amount of work done in testing seed corn last winter. Grasshoppers are abundant in some localities, but no serious damage has been reported as yet.

Brookings. All of the rye, barley, and early oat plats are now in the shock. Some of the earlier varieties of wheat are harvested. Acme (S.D.284) wheat, which is used on all of the rotation and fertilizer experimental plats, will be ready to harvest within a week. It has maintained its record for rust-resistance again this year and has not lodged seriously, even though we have had several severe rain storms accompanied by wind.

Cottonwood. Harvest is nearly completed and thrashing will be started as soon as help can be secured. All of the help except the farm foreman deserted July 15 and 20 in order to help harvest at home or to secure higher wages offered elsewhere. We hope to secure additional help within a few days so that the thrashing can be completed promptly. Cereal crops, particularly winter rye and Sixty Day oats and Odessa barley, promise fair yields.

Eureka. Nearly all of the cereal crops are seriously damaged by drought, although the State in general has received plenty of moisture in the form of local showers. The area immediately surrounding Eureka has been almost without rain for the past two months. In spite of this some of the small grain crops promise to make a fair yield. Sufficient seed will be secured to use for next year in all cases.

Highmore. All of the crops are promising. All cereals except some of the later varieties of wheat, flax, and millet are harvested and thrashing will begin the first of August. Mr. Janssen has been at Highmore since the 17th, engaged in harvesting the cereal nursery planted by Mr. McFadden. Considerable hail is reported in the vicinity, but thus far it has missed the station.

Vivian. Superintendent H. M. Sanderson of the Vivian farm has been transferred to the extension division and has been assigned to work as County Agent of Haakon County with headquarters at Philip. Mr. Charles Sayler, his assistant, has been promoted to fill the position of superintendent. Cereal crops are harvested and thrashing will begin in the very near future. The oat-rye misture obtained by seeding one bushel of oats into a thin stand of rye this spring is a success and promises a very fair yield of feed.

NORTH DAKOTA.

State Experiment Station, Fargo. (Theodore E. Stoa) Good rains over the State have much improved the crop outlook. In the drought-stricken districts the early seeded crops were almost past redemption. Late barley, flax, corn, and pastures, however, have been much benefited. In the Red River Valley, crop prospects are encouraging. Fall rye, early oats and barley are being harvested and the wheat harvest should be general by next week. Hail storms have been very destructive in several parts of the State but fortunately have been quite local. A hailstorm hit this locality on the evening of July 1. The losses inflicted varied from 10 to 100 per cent, even in adjoining fields. Barley on the west end of the College Farm was a complete loss. Experimental plats showed from 10 to 50 per cent losses. Early grain suffered most. On the same evening, two similar storms struck districts to the north, with about the same results.

With increasing temperature the corn crop is improving. In this district this crop is now tasseling.

Northern Great Plains Field Station, Mandan. (J. C. Brinsmade, Jr.) The crop outlook has greatly improved since the middle of July. Rains totaling 2.13 inches during the last half of the month brought the total precipitation for the month up to 2.37 inches.

Maximum temperature for the month was 98°, recorded July 28; the minimum 43°, recorded July 29.

Sixty Day oats in the varietal plats in the Dry Land Agriculture rotations were cut July 19 and 20, before the heavy rains. Nevertheless they appear to be yielding much better than in 1917.

The season seems to be especially favorable for showing up marked differences in yield due to different cultural methods. Oats on summer

fallow or after corn yield very well; on spring plowing after a small grain, fairly well; but on fall plowing after a small grain, very poorly. These differences were very striking both in the height and general appearance of the standing grain, and in the size of shocks after cutting.

Later varieties of oats and the barley and wheat varieties undoubtedly were greatly benefited by the rains so that the later varieties will tend to yield better than the earlier. White Smyrna barley was cut July 22 and all of the other barley varieties are being cut. Early Mountain and Swedish Select oats are being cut and Golden Rain and Victory oats are nearly ripe.

Wheat varieties are ripening, but none of them is fully ripe yet. The first evidences of rust appeared on all of the wheat varieties during the past week but only as a few red pustules on culms around the edges of plats and can not do much damage at this late date since the heads are already well filled.

Flax in all the plats has finished blooming and is ripening very rapidly. The continuously-cropped plat of N.D. Resistant No. 114 is fully ripe and is to be cut the first of August.

Mr. C. H. Clark arrived at the station July 25.

Dickinson Substation, Dickinson. (Ralph W. Smith) The continued drought was broken by a rain of 1.23 inches occurring July 23 to 25. With the exception of a shower of .25 of an inch occurring June 17, this was the only rain of importance since June 8 when 1.24 inches fell. Crops have revived considerably since the rain. Some late-sown grains will make a fair crop, especially flax. Corn, potatoes, and garden crops are much improved in condition.

Grain is now ripening normally and although the average yield for this district will be very low the prospect is much better than ten days ago.

Winter rye is practically all harvested and fields of Marquis wheat are ripe so that the general harvest is just beginning. At the substation, winter rye, early varieties of oats and barley, and Prelude wheat have been harvested.

Crosses with varieties of winter and spring wheat totaling 50 heads of the former and 15 of the latter have been made. Most of the winter wheat crosses were between Buffum, C.I.3330, and Beloglina, C.I.1543, and most of the spring wheat crosses were between rust-resistant and beardless varieties of durum.

Grasshoppers are very thick in this vicinity and are being poisoned at the substation and in the neighborhood.

MONTANA.

Judith Basin Substation, Moccasin. (P. V. Cardon) The cereal crops at this station are now in excellent condition owing to the fact that July brought a total precipitation of 2.94 inches, which is more than an inch above normal for this month. With so much moisture available, the winter wheats were enabled to fill out well and the spring grains are now maturing normally.

Winter rye in the cereal experiments and winter wheat on some of the rotation plats have been harvested and fairly good yields are expected from them. The harvest of all winter cereals will be completed early in August. It is likely, also, that the harvest of spring barley will begin within a few days. This crop has made rapid growth during the last two weeks and is much nearer maturity than any of the other spring grains, except the earlier varieties of oats which will be ready for cutting soon after the barleys. Most of the spring wheats are still somewhat green. The flax varieties are beginning to take on a light-brownish cast.

What is true of the condition of the cereal crops on this station is true of the Judith Basin generally. The gloom cast over this region by the drought of June has been dispelled and farmers are confident of profitable crops. Large fields of winter rye have been harvested and some fields of winter wheat are in the shock. Harvest outfits are seen assembling in many places and there is every indication that the winter wheat harvest will soon be over. By that time, much of the spring wheat crop will be ready to cut.

The labor problem in the Basin is not a serious one, owing to the importation of many homesteaders from the drought-stricken northern counties. Arrangements have been made whereby expenses of transportation are advanced these people and consequently they are said to be arriving in large numbers anxious to make something to offset the losses they have suffered on their own farms. The running wage for harvest hands in the Basin is $3.50 a day and board.

Work on this station has been unpleasantly handicapped during the past month because the station has been quarantined for smallpox. However, the flag has been raised and it is hoped the incident is closed.

WESTERN BASIN AND COAST AREAS.

UTAH.

Nephi Substation, Nephi. (Aaron F. Bracken) The unusual precipitation which began June 15 has continued during the whole month of July. During the last two weeks there has been a total rainfall of .52 of an inch. This has not been particularly welcomed by the farmers since most of the grain was too far advanced to have yields increased by late rains. To such station crops as beans, corn, peas, and potatoes this extra moisture will be of great value.

The grain in this section has ripened very fast during the last two weeks and as a result harvesting is going on as rapidly as possible. The average yield per acre will be somewhere near 12 bushels.

On the station most of the winter varieties of grain are harvested and the spring varieties are ripening so fast that they will be ready as soon as we are ready to cut them.

Due to the unusual amount of summer rainfall this year, the spring grains promise to give yields equal to those of winter varieties.

Grasshoppers have been quite numerous in Juab County but did not do much damage to the crops. A systematic campaign has been waged against them, however, by the County Agent. The station was quite badly infested with hoppers due to a neighbor leaving four or five acres of land uncultivated last spring. They did some damage to a few plats of grain and also to the nursery, but we succeeded in getting them under control.

IDAHO.

Aberdeen Substation, Aberdeen. (L. C. Aicher) The weather is now causing the grain to ripen rapidly. The combines in the winter wheat sections on the dry lands are in full operation. Great numbers of the small combines have been sold in this section of the State; American Falls, Rexburg and Idaho Falls being the largest distributing centers.

The dry farm on the station has practically all been harvested. The winter wheats on the rotation and cultural plats are now being thrashed. Yields range from 1½ to 5 bushels so far as the thrashing has been completed. The results mentioned come from the date-of-seeding experiments.

Practically all of the irrigated barleys have been harvested and several of the wheats are to be harvested in a day or two. The early varieties of oats and peas have been harvested. The oat nursery is beginning to turn a little. This year's potato crop is the best, so far as vine appearances are concerned, that has been grown on the station farm.

Mr. T. R. Stanton arrived on the 30th to study the oat nursery and take head samples of ripe oat varieties.

OREGON.

Harney County Dry-Farming Substation, Burns. (John H. Martin) Maximum temperature 100°, minimum 29°, precipitation .11 of an inch. A frost occurred on July 27 which injured potatoes.

Winter rye on the station is harvested and winter wheat is ready to harvest. Spring grains are beginning to ripen. The grains were nearly all destroyed by grasshoppers. Root crops and alfalfa were attacked to a less extent. Peas were only slightly injured, while flax was untouched. Wheat is now filling fa irly well, in spite of having all of the leaves and awns removed by the grasshoppers. The grasshoppers preferred barley to other grains and ate the entire stalks before moving to other crops.

Poisoned mash was applied on the infested ground three times but the hoppers were no numerous that the damage was done before the poison took effect.

Grain in Harney Valley is almost a complete failure on account of the drought and grasshopper injury. Owing to scarcity of flood water in the spring, the hay crop is very short and many trainloads of livestock are being shipped to localities where feed is obtainable. Many farmers in the vicinity of Burns are working elsewhere to earn a living.

Sherman County Branch Station, Moro. (D. E. Stephens) We are busy thrashing. On account of scarcity of help I have had to be on the job all the time and as a result some of our office work has recently been neglected. Our tillage yields are ranging from 18 to 25 bushels per acre for Turkey winter wheat. This is less than last year. The quality of the wheat this year is much better than last. We shall probably be able to report the yields of our winter wheat varietal test in a few days. We are getting some exceedingly interesting data this year on the effect of tillage methods on the quality of Turkey winter wheat.

WASHINGTON.

Adams Branch Experiment Station, Lind. (M. A. McCall)
Harvesting has been completed. Yields were very light, running from 7 bushels down. Considering the very low rainfall of the last three years and the particularly low precipitation of this present season we are fortunate to get anything at all. The total precipitation since the crop of 1916 was harvested is not over 11 inches, and since January 1, 1918, we have had only 2.75 inches of rain, together with unusual winds. In a large part of western Adams County farmers will be practically bankrupt as a result of the poor season. In fact, a large part of their crop blew out. If it were not for the wheat prices, all farmers of the wheat-producing section of Washington would be in a bad way financially. Without any doubt this is the poorest season in the history of this region.

CALIFORNIA.

Plant Introduction Garden, Chico. (Victor H. Florell)
Thrashing of cereals in field plats and nursery was completed July 13. On July 16 Mr. Florell left for Corvallis and Moro, Oreg., to assist with the harvesting and thrashing of the cereals at those points.

Biggs Rice Field Station, Biggs. (J. W. Jones) Our principal efforts during the month of July have been to free the plats, ditches, and drains from water-grass. We have the grass well under control at present, but there is still considerable grass to be pulled, as it keeps coming up.

The station has had plenty of water since irrigation began, but many of the commercial fields have been short of water during the submergence period. Now that the fields are all submerged there probably is sufficient water for everybody.

Water-grass is bad everywhere. Many old fields are so bad that no attempt is being made to eradicate the grass. New land has more grass than ever before, according to information obtained from growers of rice.

The rice on the station is growing rather slowly. This probably is due to the fact that all sowings are on old land and the temperature has not been high enough to induce a maximum growth. On commercial fields the rice on new land looks much better than on old land.

Several of the earliest varieties in the nursery are beginning to head, but most of the rows are not booting yet.

The cotton varieties are growing rather slowly and it is doubtful whether they will be of much value this season.

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. August 20, 1918. No. 12.
Project Issue.

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OFFICE ACTIVITIES

PERSONNEL

Cereal Agronomic Investigations

Noble C. Donaldson, who had charge of the cereal experiments at the Judith Basin Substation, Moccasin, Mont., from May, 1912, until February, 1918, when he left to engage in farming, returned to the Moccasin station on August 19, to render much needed assistance for a brief period.

Dr. H. V. Harlan, Agronomist in charge of Barley Investigations, returned to the office on August 17 after an absence of seven weeks spent in the study of the barley experiments at the field stations in Nebraska, Kansas, Montana, Idaho, North Dakota, and Minnesota.

Henry Meranian, temporary messenger, has been ill since August 12. He is suffering from malarial or other fever.

Cereal Disease Investigations

Ray Clark, Assistant Pathologist in the Barberry Eradication Campaign, has been called into military service. His resignation from the barberry work took effect July 8.

J. H. Clark and J. C. Fischer, Field Assistants in the Smut Control Campaign in the Eastern district, were in Washington on August 12 to report on their inspection of threshed grain on farms and in mills in Virginia for the presence of stinking smut and the nematode disease of wheat. They are now working in Maryland and will later return to points farther South.

Dr. Henry S. Conard has been appointed Assistant Pathologist, effective August 5, to assist temporarily in the Barberry Eradication Campaign in Iowa and adjoining States. Dr. Conard is Professor of Botany at Grinnell College, Iowa.

Maud Dawson was appointed Field Assistant, effective August 1, to assist in Smut Control Campaign work. She is at present engaged in laboratory work at the office in Washington. Miss Dawson is a graduate of the University of Michigan and received the degree of M. Sc. at Ohio State University.

Dr. Charles Brechsler, Field Assistant in Black and Stripe Rust Investigations, resigned from the service on July 13, as he had been called into military service.

Agnes U. Haasl received appointment as Field Assistant, effective July 13, for service in the Barberry Eradication Campaign in Minnesota.

Dr. Louis H. Pamme l, Professor of Botany at Iowa State College, has been appointed Field Assistant, effective August 10, for temporary service in barberry eradication work in Iowa.

Charles S. Reddy, leader of the Smut Control Campaign in the Great Plains district, returned to the office on August 14, for conference regarding plans for future work.

Edith K. Seymour has been appointed stenographer and typewriter, effective August 1, in connection with the Barberry Eradication Campaign in Wisconsin. Miss Seymour is a graduate of Miami University, Ohio.

Lloyd A. Spencer was appointed Field Assistant, effective July 20, to assist during the summer in the Barberry Eradication Campaign in Michigan. He is a student at the Michigan Agricultural College.

William Spuler has been appointed Assistant Pathologist, effective July 27, and is assisting in the Smut Control Campaign in Washington. Mr. Spuler is a graduate of the Washington State College and has been a teacher of botany and farmer.

Grace O. Wineland has been appointed Assistant Pathologist, effective July 30, 1918, and is assisting in the Smut Control Campaign in the East Central district. Miss Wineland is a graduate of Wittenberg College and received the degree of M.S. at Purdue University.

VISITORS.

Mr. Eugene Funk of Funk Brothers Seed Company, Bloomington, Ill., visited the office on August 10 for conference concerning cooperative work in the investigation of root and ear rot diseases of corn. Several of our ear-to-row tests and experimental plats are located on the Funk Brothers farm.

CEREAL INVESTIGATION PROJECTS

218. CEREAL DISEASE INVESTIGATIONS

218-A. Investigations of Miscellaneous Cereal and Flax Diseases.

In the investigational work which is being conducted cooperatively by this office and the State of Wisconsin, Dr. A. G. Johnson in charge, some important results have been obtained.

Control of rye ergot has been found practicable by separating sclerotia from the seed by the salt brine method and planting the seed in ergot-free soil. It is important also to diminish ergot-bearing wild grasses.

As a result of investigations conducted in conjunction with Mr. G. N. Hoffer, who is stationed at Purdue University, Lafayette, Ind., wheat scab has been found to be related to corn root-rot, which immediately condemns the use of infested corn land for the sowing of wheat, unless old diseased corn stalks are removed or possibly plowed under deeply.

Careful tests have been made of the effectiveness of smutene, an antismut prepa ration, in comparison with formaldehyde, for the prevention of oat smut. Both were found effective but smutene was found to be no better than formaldehyde which is cheaper and available everywhere.

The results of recent repeated treatments of barley seed have not as yet been summarized, but on the whole indicate general agreement with results of former years.

218-B. Investigations of Cereal Rusts.

218-B2. Black (Stem) Rust and Stripe Rust Investigations.

The Barberry Eradication Campa ign. A considerable number of data have become available showing still more clearly the relation between the rust on barberries and on wheat and other cereals. Two rather striking cases were observed in Indiana. At Wabash, a field of wheat was practically destroyed by the black stem rust. A barberry hedge grew along one side of the field. The case was so clear that 17 farmers held a field observation day under the guidance of the County Agent and immediately drew up resolutions in which they stated that the relation was so clear that they wished to go on record as favoring legislation to eradicate all common barberry bushes from the State of Indiana. The other instance was reported by Professor Jackson at Wakarusa. A hedge of barberries and two group plantings were found on a farm. A wheat field near by was so badly affected that the crop was a partial failure. A second field also was very seriously affected, as well as a number of fields in the vicinity. The evidence was absolutely convincing. This is especially

significant, since observations of this nature in Indiana previously were rather meagre.

Similar cases are reported from Ohio. One of the most striking was in Greene County where two 20-acre fields of wheat were so completely destroyed by the black stem rust that the farmers secured permission from the State Council of Defense to turn the hogs into these two fields. A heavily infected planting of barberries was growing at the entrance of one of the farms about midway between the two fields.

At Lake Preston in South Dakota, a hedge half a mile long was growing on each side of a road. Wheat fields were severely rusted to a distance of about two miles from these hedges.

In Colorado, observations showing the causal relationship of barberries to the rust on grasses and grains were made and the evidence was so conclusive that the State entomologist immediately issued a quarantine order prohibiting the importation of common barberries into the State and prohibiting their sale within the State.

The State Council of Defense of Nebraska recently issued an order for the removal of all common barberry, and state that "summary action" will follow non-compliance.

In New England and New York, barberries also were found severely infected and the rust could be traced from the bushes to grasses and grains at a time when there was little, if any, rust in localities where there were no barberries.

Barberry infection has been found in all of the States now included in the campaign and in a great many which are not included in it. Professor R. A. H. Buller of the University of Manitoba reports very severe infection at Winnipeg. As a result of the publicity which he gave the matter in the press, 2,500 bushes were removed from the city within two days.

The attacks of stem rust might have been serious this year if the weather conditions had been favorable. A tremendous quantity of rust developed on barberries early in the season and spread to neighboring grains and grasses. By the first part of July the rust had spread quite generally. This was followed by ideal rust weather during part of July, but the favorable weather occurred a little too late and the grain had already passed the danger point in most places. In spite of this fact, however, local losses have been reported from Minnesota, South Dakota, and Ohio, and, to some extent, from other States also.

It is perfectly clear from the data now at hand that there are still enough barberries growing in the eradication area to start a severe epidemic whenever weather conditions become favorable. Probably between 60 and 75 per cent of all of the bushes already have been removed from the entire area but those remaining are sufficient in number and heavily enough rusted to start a general epidemic. One of the great dangers is in the fact that many removed bushes were imperfectly dug or only cut at the surface of the ground. These sprout and the new shoots are particularly susceptible to rust attacks. Due to favorable weather conditions, new infections have been taking place on the barberries throughout the summer up to the present time. It is quite likely that this will continue until September. This insures a very large amount of uredinial material on grasses and volunteer grains. If overwintering in the uredinial stage occurs to any extent, the bushes contribute to the possibility by increasing the rust until well into the fall.

Many of the States are planning extensive exhibits at the State and county fairs. The North Dakota Sta te fair already has been held and an exhibit was made which attracted the attention of a great many farmers. By means of the exhibit, large numbers of plantings were located in North Dakota and Minnesota. It is hoped that all of the States will put on exhibits.

A number of States already have laid their plans for anti-barberry legislation at the forthcoming legislative sessions. It is quite likely that many of the States will enact laws providing for the compulsory eradication of the bushes.

If possible, a meeting of all State barberry leaders will be held some time in September to discuss progress during the past season and plans for the future.

218-C. Investigations of Fungous and Non-parasitic Diseases of Corn, Grain Sorghums, and Broomcorn (except rusts and smuts).

Corn Root and Ear Rots. The Office of Cereal Investigations is cooperating with the Purdue University Agricultural Experiment Station, Lafayette, Indiana, in the investigation of the root, stalk, and ear rots of corn. The investigations have been centered in the laboratories of the Department of Botany in the experiment station, and work was begun last fall with G. N. Hoffer, Agent, in charge.

It is planned to establish subsidiary stations throughout the corn belt States for the study of the various phases of these problems. The work this summer has been devoted almost entirely to (a) survey and (b) ear-row plot tests to correlate germination characteristics of seedlings with field performance of the ears studied.

The Plant Disease Survey has released the services of three field men, Dr. J. C. Gilman, Professor H. S. Stahl, and Dr. C. H. Otis, to make the survey of the corn belt States for the presence of these rots. These men have been in the field since June 15.

The survey results show that root rots are present in all of the corn-growing States. They seem to be more serious in the central States. The losses caused by them are difficult to estimate. The use of infested seed is responsible for primary infections of which the chief effects noted readily a re blighted plants, atrophied and spindling stalks, and also stalks withthe ears either forming slowly or completely retarded and resulting in barrenness. Later in the season fallen stalks often result as the effect of secondary root rotting. All of these phenomena, resulting from the various rots, are common in many corn fields.

Sweet corn seems to be more subject to these rots than field corn. The survey includes the sweet corn varieties. Professor Laurenz Greene, Chief in Horticulture, Purdue University Agricultural Experiment Station, has been appointed for the summer to assist in the survey of the sweet corn diseases. Professor Greene will visit the leading sweet corn seed growers in the country and ascertain the diseases affecting this crop.

Most of the plot studies are being carried on at the Bloomington, Illinois, substation, with Mr. J. R. Holbert in charge. Mr. Holbert has planted sixteen plots using the chief commercial dent varieties of corn for this purpose. The ears used for planting these plots were all carefully tested on improved germinators and thirty kernels from each ear were used.

The purpose of the plots is to correlate the field performances of the tested ears with the results obtained on the germinator. The disease-free plants in various rows are used for hand-pollination studies. Mr. Holbert is giving most of his time to the breeding work this summer. The development of disease-resistant strains of corn is being continued.

Other plots have been planted in Indiana, Tennessee, Georgia, Pennsylvania, New Jersey, and Virginia, for the study of these diseases.

Laboratory and field inoculations with the various pathogens causing the rots are being made at the central station at Lafa yette. It is here that the Plant Disease Survey collections are being worked over and many isolations of pathogens are being made. These cultures of pathogens from various parts of the country will serve for the experimental studies to be started this fall and winter.

Physoderma on Indian Corn. The Physoderma disease of corn was known to occur in the United States as early as 1911, and has been causing considerable damage in the more humid sections of the South since that time. The Office of Cereal Investigations began an exhaustive study of the problem in December, 1916. The disease has been found to be prevalent throughout the Atlantic and Gulf Coast States where it is doing considerable damage in the low humid districts. In 1917 this damage reached as high as 5 to 10 per cent in certain localities. It is also known to occur farther west from central Texas, north to southeastern South Dakota, and thence eastward from southeastern Minnesota through southern Illinois, Indiana, and Ohio, to central New Jersey. The disease has, perhaps, reached almost, if not quite, to its northern and western limits as permitted by weather factors.

The fruiting bodies of the fungus live over winter on the old diseased corn plants and in the soil, and germinate the following spring or summer to infect the new corn crop. These spores are easily carried to the corn plants by wind and spattering raindrops.

The dry weather in the South prevented any serious developments of the disease in that section during the early summer of 1918. However, early July, at which time these observations were made, is not too late for severe attacks on late corn, provided wet weather occurs.

Numerous field observations have suggested the possibility of controlling the disease to a certain extent through crop rotation and crop sanitation. However, no definite experiments have been conducted to determine this. A manuscript covering the investigation of this disease by Dr. Tisdale, Assistant Pathologist in charge of this work, is going forward for publication in the Journal of Agricultural Research.

218-D. Investigations of Cereal Smuts.

Smut Control Campaign and Cereal Disease Survey.

Ohio. (W. G. Stover, Leader). With the assistance of other cereal disease men we made a survey of cereal diseases of the State in June and July. The western part is most afflicted. Stinking smut seems to be more prevalent than formerly, according to statements of farmers, but this may be in part because more attention has been given the matter this summer. Scab is very serious in southern, central and western Ohio. Loose smut was found in abundance, 6 per cent being very common, 10 to 15 per cent frequent, and 25 per cent occasional. Stem rust was very destructive, especially in the district around Dayton; Leaf rust everywhere; Anthracnose in the eastern part of the State especially; black chaff common.

A booth and a cereal disease exhibit, with control methods demonstrations, is being arranged for the State Fair. Other fairs will be visited if possible.

Many smut control demonstrations will be given, starting early in September. County agents and most farmers are keenly interested more than ever before.

A circular on Prevention of Cereal Smuts has been written and mimeographed. A smaller circular on Seed Treatment for Stinking Smut of Wheat has also been prepared. A number of press articles are going out through the Extension Department of the College of Agriculture.

Wheat Day and other meetings of farmers have been addressed on the subject of smut control, and demonstrations given. Everywhere a fine interest has been manifest.

Correspondence on the subject has been almost voluminous. County agents want very much to use the dry method but we are in doubt. Further experiments are now being conducted here to determine the amount of seed injury to be expected.

Representatives of the Vocational Education work have been addressed twice. They expect to put on campaigns in their localities. County superintendents of schools will be asked to assist among their teachers in counties which have no agricultural agent.

Altogether, prospects are fine for more treated seed wheat in Ohio this fall than ever before.

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East Central District (Michigan, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi, Alabama). R. J. Morgan, Leader. As was expected, we found bunt in all of the States, varying in each from a fraction of a per cent to 75 per cent; however, the latter condition was not common. The loose smut in wheat is apparently much worse in the South than in the North.

We found both loose and covered smut in oats. The survey shows that the southern farmer is more likely to treat wheat than oats and most generally uses the bluestone solution which has been in use there since the Civil War.

Barley stripe was found in varying degrees wherever barley is being grown; also both of the barley smuts and, in a few cases, ergot of barley was found. In one case nearly five per cent of the heads were infected.

The stem smut of rye was very rare and ergot was not as bad as in previous years.

We found some seed injury due to the improper use of the formaldehyde treatment. The one thing that has done the most damage is the statement found in one of the bulletins to the effect that as soon as the grain has been treated it should be covered and then allowed to dry, then sown immediately or stored in disinfected sacks. In my territory this has resulted in a certain amount damage because it gives the farmer the idea that the grain can be held indefinitely while the understanding is that to get the best results the grain should be sown immediately or within twelve hours after treatment. Treatment of oats with bluestone (copper sulphate), unless followed by a dip in milk of lime, will result in some injury to the seed, regardless of whether the grain is or is not planted promptly after treatment.

We are at present arranging meetings for the purpose of seed treatment demonstrations, and are planning strenuous seed-treatment work in the central States during the coming fall. The machinery of the campaign is outlined and working in six of our States at the present time, due to the excellent cooperative spirit of the States, many of which have taken the initiative in the arrangements for the seed treatment work.

We are going over the top, nine States strong. All will do seed treatment work this fall and some will have another campaign next spring.

Mr. Morgan, who made this report is now in Officers' Training Camp, Camp Zachary Taylor, Louisville, Ky.

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West Central District (Minnesota, Iowa, Missouri, Arkansas, Louisiana) George M. Reed, Leader. The following are some of the most striking results of the Cereal Disease Survey in my territory:

Covered smut of wheat was found in Arkansas to the extent of 25 per cent on one or more farms; in Missouri on several farms to an extent of more than 50 per cent, in one case 72 per cent; in Iowa, more than 50 per cent on one or two farms; in Minnesota, more than 50 per cent on several farms, and on one as much as 74 per cent. Covered smut of wheat is found to be very prevalent throughout Missouri and the central part of Minnesota. Proportionately less was found in Iowa.

Wheat scab proved to be very severe in Iowa, in some cases reducing the yield more than 50 per cent. Scab was found also in northern Missouri and in southern Minnesota, but little damage was being done.

Ergot of rye was found in one field in Iowa to the extent of 24 per cent of the heads infected.

Oat smut is generally prevalent, varying from 5 to 35 per cent. Many farms, of course, were entirely free.

The survey in Minnesota was finished August 5. Nearly every county in the State was visited by a field assistant, who examined as many farms as possible.

A conference of the field assistants was held at University Farm, Minnesota, on August 6. Director A. D. Wilson, County Agent Leader F. E. Balmer, and Dr. Bisby of the Department of Plant Pathology attended the conference. We presented the chief results of the survey in Minnesota. At a later conference with Dr. Bisby and Mr. Balmer, general plans for the seed treatment campaign in the winter and spring were developed.

Demonstrations for the control of covered smut of wheat are now being made in Arkansas and Missouri. In Missouri the field assistants are spending about three days in a county and giving demonstrations before three to five groups of farmers each day. The demonstrations are being well attended. Unusual interest has been aroused in the prevention of covered smut, in a large measure due to the work of the survey/ Plans are about completed for starting the seed treatment campaign for winter wheat in Iowa.

R. A. Langenbacher, A. L. Bakke, and H. H. Plagge are conducting the demonstrations in Missouri. M. C. Gillis and C. M. Tucker are working in Arkansas.

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Great Plains District (North Dakota, South Dakota, Montana, Nebraska, Wyoming, Kansas, Colorado, Oklahoma, Texas, New Mexico) Charles S. Reddy, Leader. The Cereal Disease Surveyin Nebraska, North and South Dakota and Montana has been completed. The greatest losses of wheat due to smut have been found in Nebraska where the percentages are not high but the infection is general throughout the State. Very little smut was found in North Dakota due to the fact that 95 per cent of the farmers in that State treat their wheat. The smuts are the cereal diseases of the most economic importance, although root diseases of wheat are taking a large toll in Montana. No stem rust was found in Montana, though it was reported in one locality. Scab was not found in that State.

Having worked progressively fromthe Mexican border to the Canadian line in the disease survey, the Great Plains Smut Control Campaign squad is now beginning seed treatment in Montana. This State has started a thorough campa ign for seed treatment next fall and the whole force of county agents of the wheat-growing counties are giving most of their time to it for a short period. The State Experiment Station has sent out a circular to the wheat growers of Montana, urging them tocooperate in the campaign. Seed treatment has been practiced extensively in this State, probably about 75 per cent of the farmers doing treatment work.

Nevertheless it is possible to find localities where loss from smut is more than 40 per cent.

All of the States are cooperating extensively in surveys and control work.

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Washington. (George L. Zundel, Leader). Our plant disease survey is progressing very well. Early in the season we started in Walla Walla County. Then going into Asotin County we worked north through Whitman County which we will finish by the end of this week. Generally speaking, the field workers are finding very little smut. This is, no doubt, due to the fact that we had a very long dry fall and a dry summer and that most of the grain in this section of the country is spring grain. However, in the winter grain section, not more than an average of 5 or 6 per cent of smut has been found. In one field in Walla Walla County we found 60 per cent of smut, but the owner of this grain had not treated his seed. The highest per cent of smut found in Asotin County was 15 per cent, in a patch of Turkey wheat. So far as reports go, the highest infection of smut found in Whitman County is 57 per cent. This was in the field located near Palouse, Washington.

Next week the survey work will be started in Spokane, Pend Oreille, Stevens, Ferry, and Okanogan counties. Mr. Stevenson has just returned from a cereal disease survey of Grant and Douglas counties. In Grant county he found very little wheat and very little smut. In Douglas County he found the crops fairly normal but very little smut.

A. C. Wilcox has been transferred for a few weeks from the California district to the Washington district. At the present time he is in the Puget Sound counties, looking up cereal diseases. Before he returns he will have completed the survey in Snohomish, Skagit, Island, Thurston, Lewis, and Cowlitz counties. We have had reports of a Rhizoctonia fungus attacking wheat and oats on the west coast, and his special mission is to look up and report on this disease

C. W. Johnson also has been transferred from the California district to the Washington district for a few weeks. His special problem is determining the species of oat smuts present in this State and their exact geographical distribution.

I am asking all the field men to send in samples of smut from practically every field that they survey so that, if time permits, we can make a microscopic examination of these species and determine if we have one or more species of stinking smut in this State.

The county agents are taking a personal interest in all of our work and are treating the boys royally. The farmers also are welcoming the smut survey with open arms and have taken a keen interest in having the boys help them solve their problems. Hardly a day goes

by but the boys have two or three invitations to dinner.

One of our boys, Mr. Barnes, has been chased out of a field at the point of a gun, the farmer thinking that he was an I.W.W.

* * * * * *

California. (William W. Mackie, Leader). I have just returned from an extended trip to the northeastern counties of California. I visited Sierra Valley in Plumas County; Honey Lake Valley, Big Valley and Round Valley in Lassen County; Fall River Valley in Shasta County; and Alturas, Warm Springs, Surprise, and Goose Lake Valleys in Modoc County.

The whole region of north and northeastern California would profit by planting larger areas of winter wheat of a suitable variety, preferably Turkey Red. Early maturing varieties of spring wheat such as Marquis should be encouraged. Late varieties are more subject to frost and drought. Due to droughty conditions summer fallowing should be the rule where irrigation is not possible. Rotation of wheat with alfa lfa in both irrigated and dry land has been found profitable. Improper methods of seed treatment have made the existence of smut possible. Universal use of standard remedies for seed treatment will certainly promptly eradicate the smut except the loose smut of wheat which should be entirely eliminated by planting only seed free from this species. Seed free from this smut can be obtained readily.

The wheat fields showing loose smut were all traced to a single source. Importations of Bluestem wheat apparently from a locality in Oregon or Washington infected a considerable area otherwise free from this smut. No apparent increase was observed.

An increase of many thousands of acres of wheat is possible in the northeastern counties of California.

Plumas County. Sierra Valley was badly affected with bunt in the wheat, and hidden smut of oats, due to lack of proper seed treatment. No soil infection was observed.

The needs of the Valley are (1) standard seed treatment for smuts, (2) replacing the present varieties (Bluestem, Sonora, Club) by frost-resistant Turkey Red winter wheat for fall planting, and Marquis hard spring wheat for spring planting (If no frost occurs, Sonora may be planted late to resist drought), (3) better and more extensive summer fallow, and (4) winter oats and winter barley should be tested because spring plantings are frequently frosted or droughted.

Lassen County and Shasta County. Honey Lake Valley has had a large increase in the acreage of wheat with heavy yields on the irrigated and fall-sown areas. Little or no bunt was found due to the universal practice of seed treatment. The practice of seed treatment is equally divided between the formaldehyde and bluestone methods, with formaldehyde becoming increasingly popular. Rye was formerly badly smutted but the rejection of infected seed and treatment with bluestone of seed on

adjacent ranches completely eradicated it. Loose smut of wheat, however, is scattered over many fields in Bluestem wheat imported by the Riverside Milling Company, of Reno, Nevada. Fall plantings of Turkey Red winter wheat should be extended especially on summer-fallowed land. Hard early spring wheat like Marquis should be planted to escape frost and drought. Summer fallowing should be more extensively practiced where irrigation is not possible. Wheat rotation with alfalfa is popular and gives good yie lds on both irrigated and unirrigated fields.

In Round Valley, Big Valley, and Fall River Valley, some bunt occurs where seed was not treated or where the solutions were too weak. Bluestone appeared to be universally preferred. Turkey Red winter wheat is largely planted and is coming into greater favor because of its resistance to frost. Galgalos , the common wheat of these three valleys is very subject to spring frosts when fall sown and to drought when spring sown. Winter oats and winter barley should be tested. White oats and Texas Red oats are subject to frost when spring planted.

Modoc County. Surprise Valley in Modoc County produces considerable wheat in rotation with alfalfa. Only one small lot of smutty wheat was found in this valley. It was not thrashed but fed to chickens to avoid seed contamination by thrashing. Bluestone and formaldehyde treatments are equal in popularity. Some hidden smut of oats was found where a weak solution of formaldehyde had been used. Fall planting of Turkey Red winter wheat and spring planting of Bluestem and Marquis wheats appear advisable. Summer fallowing together with fall planting should be practiced where irrigation water is not available. Wheat is universally rotated with both dry land and irrigated a lfalfa,with excellent results.

Goose Lake Valley grows spring wheat almost entirely. Fall planted wheat usually gives the best results when it does not winterkill. Turkey Red should be planted in the fall, and Bluestem, Club, or Marquis in the spring, especially in irrigated land. Bunt is all over the Valley but is severe only where wheat was not rotated with alfalfa. Where wheat followed wheat, soil infection was very disastrous. Bluestone is the favorite remedy for smut but the solution used has been too weak. Covered smut of barley is common. No treatment has been given seed barley.

In the Alturas region, loose smut of wheat and bunt were both encountered. In the region where irrigation is not possible, summer fallowing should be practiced. Winter wheat should be planted.

Siskiyou and Scott Valleys were not visited because the grain then had already been harvested.

Thrasher Explosions and Fires.

Washington-Idaho. (George L.Zundel)

[illegible] (George [illegible]) August 7 we held a conference in Moscow, Idaho, with all of the men who will be on the thrashing machines, and gave them complete instructions. Mr. Ruth of the Portland Grain Office, Mr. Gilmore of the Bureau of Markets, and Mr. Roethe of the Bureau of Chemistry also were present. The boys received instructions from each of the Bureaus and their equipment was furnished them.

At the present time we have the 1917 Rumley located at Lewiston, Idaho. Williams states this morning that they are moving to Vollmer, Idaho. At the present time this machine has not thrashed any fields where there was smut, but we hope that it will get into smut as soon as it reaches the Nez Perce pra irie.

Mr. Nevins has charge of the Aultman and Taylor machine, model 1918, located at Kendrick, Idaho. At the beginning of the season we had two of these machines, but due to the fact that one of them did not give good results it is being turned back to the factory. This machine has not thrashed in any fields of smutty grain until recently. I received samples of smut collections from Mr. Nevins from fields in which there was 25 per cent smut.

The Russell machine, located at Palouse, Washington, is under the direction of Mr. Sly. This machine is just preparing to go to work.

The Holt combine is located at Oakesdale, Washington, and is doing very good work. Mr. Sweeney estimates that the fan has a cleaning power of between 50 and 60 per cent.

The two New Racine machines, located at Tekoa , Washington, will be under the direction of Mr. Thompson and Mr. Williams. At present these machines are not thrashing wheat but will have about ten days thrashing peas and then they will start in on the wheat.

The 1918 Case machine will be loaned to a thrasher near Waverly, and the Bureau of Markets is providing a man for that machine.

I am sorry to report that the machine that Dr. Jensen selected will not operate this season, due to the fact that the country around Garfield has so many of the small McCormick combines that the operator of the machine feels it will not pay him to go into the field.

The thrashing machine work has been hampered greatly, due to the fact that we are having a very wet harvest. Hardly 24 hours pass by without some sort of a shower. This makes it very hard for the farmers to harvest their grain. The reports of a poor crop in the Pacific Northwest have proved untrue. As far as the fall grain is concerned, we have a bumper crop, and the spring grain is not so bad as we had previously a nticipated.

Experiments to Determine Seed Injury from Standard Disinfecting Methods.

Under the auspices of the War Emergency Board of American Plant Pathologists, organized at the Pittsburgh meeting of the Phytopathological Society, this office has undertaken the supervision of experiments to determine the injury resulting to cereal seeds under standard methods of disinfection for smut control. These have been carried out by the pathologists of 16 of the grain-growing States. Mr. Alden A. Potter, Assistant Pathologist, was appointed by the Board as chairman of a committee to lead an extensive informal cooperation among the cereal pathologists and other botanists in this country and Canada, who might be interested in an investigation of the practical phases of seed treatment for cereals. The other members of the committee are Drs. Stakman and A. G. Johnson, who are also members of the staff of the Office of Cereal Investigations but acting as representatives of the States of Minnesota and Wisconsin in this work, the former being chairman of the Research Committee for all the work of the War Board. Considerable assistance in the work has also been given by several of the field assistants assigned to smut work on the emergency staff of the office, including G. R. Hoerner, F. F. Blaine, K. M. Fradenburg, and M. T. Binney.

In accordance with an outline prepared by the committee and sent to interested workers, 78 different lots of seed grain were treated with copper sulphate, formaldehyde, and hot water, and tested for resultant injury to germination. In most cases the seed was sent to Washington and the germination tested by the Seed Laboratory of this Bureau. Moisture analyses of the original seed lots before treatment were made by the Office of Grain Standardization of the Bureau of Markets. The work involved the counting of some 850,000 seeds (8500 germination tests) after more than 2,000 different treatments. In addition to the data gathered in this way, the office has undertaken to gather similar data from seed treated on the farm. Messrs. Mackie in California, Thompson in Washington, Fradenburg in Minnesota, and Gross in Oklahoma have furnished data or sent samples. These results have been found to agree essentially with those obtained from the grain treated in the laboratory. Messrs. Gregory and Smith at the Cornell station in New York, under appointment from this office, also have carried out some experiments which have contributed to results. The following are the most important conclusions:

1. Of all the small grains, barley is the cereal least susceptible to injury by any of the standard treatments. This controverts a general belief as expressed in many bulletins.
2. Oats is often, though not always, much injured by copper sulphate, but seldom by formaldehyde or hot water.
3. Wheat and rye are considerably injured by the short hot water treatment recommended in current literature.
4. The percentage germination of seed grain before treatment is not an index of what it will be afterwards, i.e. of the proportion of injury which may be expected. Seed lots of good quality (high germination) may be seriously injured while some lots showing poor germination may be but slightly injured.

5. There often are marked differences in the susceptibility of different lots of seed to injury by the various treatments, and particularly by copper sulphate.
6. Holding seed after treatment by any of the methods recommended in practice does not often have any appreciable bad effect on the germination. It seems probable, however, that farm conditions are so likely to interfere with adequate drying and airing of the grain that it is advisable to recommend prompt sowing after treatment with formaldehyde and copper sulphate.
7. Copper sulphate is the only fungicide showing a marked tendency to injure seed grain. Liming prevents this injury to a large extent. This conclusion has long been established in literature and is further substantiated by these tests.

This work will be continued and expanded by the War Board Committee during the coming year, particular emphasis being laid for the present on winter wheat and rye. Mr. Charles S. Reddy has been assigned to devote full time for the office to the work on seed injury. Other members of the emergency staff will be assigned at times to assist in this work at the various stations cooperating with the War Board, and also in the laboratories in Washington, D.C.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S.Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. September 30, 1918. No. 13
Miscellaneous Issue.

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BY WAY OF EXPLANATION

No Cereal Courier has been issued since No. 12, under date of August 20. Our one object in life during the last six weeks has been to keep the two great food conservation campaigns going at top speed. Everything has been subordinated to this purpose. The Smut Control Campaign and the campaign for control and eradication of the barberry are now approaching a highly successful close for this season, and attention can be given to things neglected. The present issue of the Courier will contain information concerning the personnel for the period since the last issue. It is planned to publish the September station issue of the Courier at an early date, prefixing the most important August data to the September reports in each case.

PERSONNEL (CLERICAL STAFF).

Allene Alexander, of Greenwich, La., was appointed Clerk, effective September 23, for service in Washington. She was formerly a teacher in the schools of Vivian, La.

William G. Bengel, formerly of the clerical staff, is now with the American Expeditionary Forces, attached to Headquarters Co., 110th F. A. Letters received from him by Mrs. Kinney indicate that he is enjoying his experiences in France.

Robert S. Caruthers, Henry Maranian, and Robert Yates, who have been serving as messengers during their summer vacation, resigned in September to return to school.

Marcellene R. George, Stenographer and Typist, has been transferred from the office in Washington to the cooperative Cereal Disease project at Purdue University, East Lafayette, Ind. She left Washington on September 21.

Hugh Huntington was appointed messenger, effective September 16.

T. Enid King has been appointed Clerk (Typist), effective September 2, and is assisting in the office in Washington. Miss King is from Columbus, Ohio, and has attended Ohio State University for two years.

Rose Lefebvre has been added to the office staff of Cereal Disease Investigations. Her appointment as Clerk (Stenographer-Typist) took effect September 14. Miss Lefebvre was formerly with the Maryland Casualty Co. in Minneapolis, Minn.

Corland D. Little has been designated Executive Clerk of the office, effective August 26. Mr. Little has been in the clerical staff of the office since May 16, 1918.

Mary L. Middleton, of Stonewall, La., was appointed Clerk, effective September 1, for Washington service. Miss Middleton was formerly a teacher in the schools of Vivian, La.

James E. Norton, Stenographer and Typist at theSherman County Branch Station, Moro, Oregon, resigned, effective September 30, to accept a position as teacher in the Pueblo High School, Pueblo, Colorado.

Virginia Putman has been appointed Clerk, effective August 28, to assist in the office in Washington. Miss Putman comes from Birmingham, Ala., where she was a school teacher.

PERSONNEL (AGRONOMIC PROJECTS)

Stephen Anthony, who for several years was Technologist in Barley Investigations and who left August 31, 1917, to study at Chicago University, has been reappointed for a temporary period so that he can prepare for publication an article on the germination of barley pollen by a method which he developed while associated with this office, but has not found it convenient to prepare for publication until this time.

Charles E. Chambliss, Agronomist in charge of Rice Investigations, who has spent the summer in Porto Rico and Santa Domingo assisting in the development of the rice industry, returned to Washington on September 19 and left on September 25 to visit the experiment stations in Louisiana, Texas, Arkansas and Oklahoma. He will return about the end of November.

C. H. Clark, Assistant Agronomist in charge of Flax Investigations, returned to Washington on September 27. During August and September Mr. Clark visited experiment stations in the West for the purpose of studying flax experiments and consulting with station officials. He also assisted in connection with the administration of President Wilson's special fund to supply seed wheat and rye for fall sowing in drought-stricken areas.

J. A. Clark, Scientific Assistant in charge of Western Wheat Investigations, after a three-months tour of the experiment stations in the West, returned to Washington on September 1.

George Janssen, Field Assistant at the Highmore Substation, Highmore, S. Dak., has been called for military service. His resignation took effect September 18. He expects to be enrolled as a soldier student at the South Dakota Agricultural College for some time.

Titus B. Maxwell, whose term of appointment as temporary Junior Chemist in this office expired August 23, is now at Camp Gordon, Ga., in the 24th Co., 6th Training Battalion, 157th Depot Brigade, according to a letter received from him under date of September 15.

B. E. Rothgeb, Scientific Assistant in Charge of Grain-Sorghum and Broomcorn Investigations, returned to Washington on September 17, after a five-weeks field trip for the purpose of supervising and studying broomcorn and grain-sorghum experiments at the experiment stations in Texas, Oklahoma and New Mexico, and studying the production of broomcorn under irrigation in the Rio Grande Valley around Mission, McAllen and Pharr, Texas.

Lewis J. Stadler, Agent in cooperative work between this office and the Missouri Experiment Station, resigned effective August 31, to enter the officers training school at Camp Taylor. His present address is 30th Training Battery, F.A.C., O.T.S., Camp Taylor, Louisville, Ky.

John L. Toevs, laborer at the Aberdeen Substation, Aberdeen, Idaho, resigned August 31 to enter college.

PERSONNEL (PATHOLOGIC PROJECTS)

REGULAR PROJECTS.

Morgan T. Binney, formerly Collaborator in connection with cooperative barley disease investigations at Madison, Wisc., has been appointed Assistant Pathologist, effective September 4, and is assisting in the investigations of the root, stalk and ear rots of corn at Bloomington, Ill.

~~New York Breeding of Corn Field Assistant in Plant Disease Survey~~

Elmo Jesse Engel was appointed Field Assistant, effective August 29, to assist in conducting the investigations on root and ear diseases of corn which are being carried on at Bloomington, Illinois, in cooperation with Purdue University.

Dr. James R. Holbert, was appointed Assistant Pathologist, effective August 21, to assist in conducting field, plat and nursery experiments in the investigation of the root, stalk and ear rots of corn. Dr. Holbert is a graduate of Purdue University and for a number of years has been agronomist in charge of corn improvement work for the Funk Brothers Seed Company, Bloomington, Illinois.

Dr. H. B. Humphrey, Pathologist in Charge of Cereal Disease Investigations, left Washington on September 18 for the purpose of visiting experiment stations in the West, conferring with station officials, extension directors, and pathologists regarding plans for future work on research projects and emergency work. On September 26-28 he attended the conference at Minneapolis, Minn., of Barberry Eradication and Smut Control workers in cooperation with the War Emergency Board of American Plant Pathologists. He will return about October 16.

Charles W. Hungerford, Assistant Pathologist, who has been in charge of the investigations of Black and Stripe Rust at Corvallis, Oregon, was in Washington from September 11 to 22 for conference. He is now acting in charge of the Cereal Rust project.

Herbert S. Jackson, Chief in Botany at Purdue University Agricultural Experiment Station, has been appointed Collaborator, effective August 29, in connection with the cooperative project between Purdue University Agricultural Experiment Station and this office in the investigation of leaf rusts of wheat, barley, rye and corn.

Dr. A. G. Johnson, Associate Professor of Plant Pathology at Wisconsin College of Agriculture, has been in Washington since September 12 assisting in the administrative work of Cereal Disease Investigations during the absence of Dr. Humphrey. He will remain here until Dr. Humphrey returns.

Dr. Edwin B. Mains, Botanist of Purdue Agricultural Experiment Station has been appointed Agent, effective October 1. He will conduct investigations on the leaf rusts of wheat, barley, rye and corn in the cooperative project between this office and Purdue Agricultural Experiment Station.

John H. Parker has received temporary appointment as Scientific Assistant, effective October 15, for the purpose of completing the compilation of results of cooperative breeding and selection work which he conducted at St. Paul Minn., Ames, Iowa, and Manhattan, Kansas.

Alden A. Potter, left Washington on September 6 for the purpose of studying his experiments on smuts of corn and sorghum at Manhattan, Kansas, and conferring with Professor Melchers with regard to a projected manuscript on the cooperative corn smut investigations at Manhattan. Mr. Potter also will visit Chicago and points in Indiana to inspect grain driers with a view to ascertaining their adaptability in connection with treatment of seed wheat to prevent loose smut. He was authorized to attend the conference of Barberry Eradication and Smut Control workers in cooperation with the War Emergency Board of American Plant Pathologists at Minneapolis on September 26-28. He will return about October 7.

Dr. Wendell H. Tisdale, Assistant Pathologist in charge of the investigation of the Physoderma disease of corn, resigned, effective August 31, to acceptathe position of State Pathologist in North Carolina.

Ivan E. White, Assistant Pathologist in connection with the cooperative work at Manhattan, Kansas, resigned August 28, as he had been called into military service.

EMERGENCY PROJECTS.

Barberry Control Campaign.

Dr. Elmer D. Ball, State Entomologist of Wisconsin, has received appointment as Collaborator, effective September 16. He will direct the cooperative Barberry Eradication work in the states of Wisconsin, with headquarters at Madison, Wisc.

Ray Clark, who resigned from the Barberry Eradication service on July 8 to enter the Army, is stationed at Camp Pike, Arkansas, according to a letter received from him under date of October 3.

Dr. Richard M. Holman was appointed Field Assistant, effective August 28, to assist in the campaign in Indiana, with headquarters at Crawfordsville, Ind. He is a graduate of Stanford University, has studied at the University of Leipzig and received the degree of Ph. D. from the University of California. He is a botanist of considerable experience and has taught the subject in various colleges for several years.

Edwin A. Jenner, who was appointed Field Assistant, effective August 19, to assist in the campaign in Iowa and adjoining states, resigned September 11 to accept a position as teacher of biology at the State Normal School, La Crosse, Wis.

M. B. Kroft, Field Assistant in the Indiana work, was called into military service and resigned from this office on August 13. He is now at Camp Johnston, Florida, in the 3rd Service Company,

Melvin A. Leach has resigned from his work as Assistant Pathologist in the Michigan work. His resignation took effect August 31.

W. E. Leer, Field Assistant in the Indiana work, resigned effective August 31, to resume his studies at Purdue University.

Harold H. McKinney, who has been serving as Assistant Pathologist in the work in Michigan and Wisconsin since August 19, resigned on September 15 to take up his college studies at the University of Wisconsin.

Allen G. Newhall has been appointed Agent, effective September 25, and will act as assistant State leader in the campaign in Minnesota, with headquarters at St. Paul, Minn. He was previously employed by the Office of Plant Disease Survey and, having completed his work there, it was requested that he be transferred to this office.

Mrs. Bessie K. Pierce, Field Assistant, who has been engaged in educational work among the boys' and girls' clubs in connection with the Barberry Eradication Campaign, has completed her work and resigned to take up other employment. Her resignation took effect September 25.

Laura Rischatsch, who has been temporarily assisting as stenographer and typist, Illinois University, Urbana, resigned on September 5.

Henry W. Thurston was appointed Field Assistant, effective August 12, to assist in the work in Nebraska, with headquarters at Lincoln, Nebraska. He is a graduate of the University of Illinois and has also studied at Columbia University graduate school. He has had special training in Mycology and Plant Pathology.

Dr. E. Mead Wilcox, head of the Department of Plant Pathology at Nebraska Agricultural College, and leader of the barberry work in Nebraska, has obtained leave of absence from his work at the college for a short time and is giving his entire time to the barberry work under appointment as Field Assistant, effective August 12.

Orville T. Wilson, Assistant Pathologist, resigned on August 24 to resume his teaching duties at the University of Cincinnati.

Harry C. Young, Assistant Pathologist in the Michigan work, resigned August 31. He is now Second Lieutenant, Sanitary Corps, Rockefeller Institute, New York City.

Smut Control Campaign

F. F. Blaine has succeeded Dr. Duncan S. Johnson as leader of the Smut Control Campaign in the Eastern district, (Florida to Maine). Dr. Johnson resigned on August 23 to resume his work at Johns-Hopkins University.

Newton C. Brackett is now a candidate at the officers training school at Camp Lee. His address is 12th Co., C.O.T.S., Camp Lee, Va.

George R. Bridgeforth, Field Assistant in the East Central District, resigned effective July 20. He is now Principal of the Industrial and Educational Institute at Topeka, Kansas.

Justus J. Champlin was appointed Field Assistant, effective August 26, and is serving in the Great Plains district. Mr. Champlin has had much practical experience in the growing of cereals and is well acquainted with conditions in the grain growing states.

Bliss F. Dana has been appointed Assistant Pathologist, effective September 9, to assist in the campaign in Washington, Oregon and Idaho. Mr. Dana graduated from Washington State College where he also received the degree of M. S and for the past two years has been associated with the Department of Plant Pathology of that college.

George W. Goodwin has been appointed Field Assistant, effective September 3, to assist in the East Central District. He is a graduate of South Carolina State College and has also studied at Tuskegee Institute in Alabama.

William Elbert Green has been appointed Field Assistant, effective September 11. He has been assigned for the present to the work in Washington State. Mr. Green is a graduate of the A. and M. College, Stillwater, Okla., and has also studied at the University of Oklahoma. He has taught agriculture for several years in Kendall College, Tulsa, Okla.

David Q. Grove, was appointed Field Assistant, effective August 20, and is assisting in the campaign in the Great Plains District. Mr. Grove is a graduate of Davey Institute, Kent, Ohio, and for two years taught Plant Pathology in Davey Institute. He has also had practical experience in growing cereal crops.

Joseph M. Guerrettaz, Assistant Pathologist in the work in Washington State, resigned August 31 to accept a position as Principal of Schools at Uniontown, Washington.

Harlow Williamson Harvey was appointed Field Assistant, effective August 28, and is engaged in Smut Control work in the Eastern District. Mr. Harvey is a graduate of Georgia State College of Agriculture and has made a special study of fungous diseases of plants.

H. C. Jacobs, Field Assistant in the East Central district, has been called into military service. His resignation from this office took effect August 12.

Dr. Duncan S. Johnson has resigned from the leadership of the Smut Control Campaign in the Eastern district to resume his work as Professor of Botany in Johns-Hopkins University, Baltimore, Md. His resignation took effect August 23 and his place has been taken by Mr. F. F. Blaisdell.

Giles R. Kerns, Assistant Pathologist in the Smut Control work in Washington and Oregon, resigned on August 29 to accept a teaching position.

Harvey A. Lyon was appointed Field Assistant, effective August 26, for service in the East Central district. Mr. Lyon received his education at Michigan State Agricultural College and has had considerable practical farm experience.

James J. F. McMurphy has received appointment as Field Assistant, effective September 3, and is assisting in the work in California. He is a graduate of Stanford University where he also received the degree of A.M. and has been instructor of Mycology and Plant Pathology at Stanford University for several years.

Sterling L. Miner, Field Assistant in the campaign in the East Central district, who resigned to undergo an operation for appendicitis, is fully recovered. He has been called into military service and is now at Camp Cody, New Mexico.

A. W. Monosmith, Field Assistant in the East Central district, resigned, effective August 10, to accept a position as County Agent under the States Relations Service.

Werner L. Nehrling has been appointed Field Assistant, effective September 7 to assist in the campaign in Washington State. Mr. Nehrling received his education at Rollins College, Winter Park, Florida, and at the University of Illinois and has had considerable practical experience along agricultural lines.

Glenn E. Panton, Field Assistant in the East Central district, resigned from this work August 27, as he had been called into military service. He is now in the 28th Co., 7th Bn., 164 Depot brigade, Camp Funston, Kans.

F. J. Petry, Field Assistant in Smut Control work in the West Central district, resigned effective September 9, to resume his duties as instructor at Purdue University.

Fred E. Robbins was appointed Field Assistant, effective August 17, for service in the East Central district. Mr. Robbins is a graduate of Purdue University, where he also received the degree of M.S.A. He has made a study of crop production, particularly of cereals.

John A. Slipher was appointed Assistant Pathologist, effective August 24, and is assisting in the East Central district (Alabama and Mississippi Nothward). Mr. Slipher is a graduate of Ohio State University and has previously been employed by the Extension Department of Purdue University in work similar to that in which he is now engaged.

William Snyder, Assistant Pathologist in the work in Washington State resigned August 31 to accept a position as Assistant Principal of Schools at Uniontown, Wash.

Alvord C. Stanton was appointed Assistant Pathologist, effective August 17, to assist in the West Central district (Minnesota to Louisiana). He is a graduate of Northwestern University and has also studied at Wisconsin State University and Chicago University and has had considerable experience in teaching botany and allied subjects.

Fred J. Stevenson, Field Assistant in the Smut Control Campaign in the State of Washington, has resigned to take a teaching position. His resignation took effect September 7.

Wm. R. Taylor, Assistant Pathologist in the Eastern district, resigned August 31 to resume his college studies.

J. J. Wilson, former Field Assistant in the Smut Control and Barberry Eradication Campaigns, is now a 2nd Lieutenant, U.S.A.

J. A. Young, Assistant Pathologist in the campaign in Oregon, resigned on August 21 to go into teaching work.

FISCAL MATTERS.

MOVING EXPENSE ACCOUNTS ALONG.

A vigorous and protracted drive has been made by the entire office force to bring the fiscal matters of the office up to date. Expense accounts have been given especial attention. Owing to the large number of new and inexperienced employees who were in travel status, many accounts were not in shape to pass the auditors in the Office of Records. In the four weeks from September 9 to October 5, inclusive, 215 expense accounts were examined and prepared for audit in our office. By periods covered, these reimbursement accounts are distributed as follows:

Fiscal Year 1918.

Reimbursement accounts (original), March to June 1918 inclusive	24
Reimbursement accounts (resubmitted items), March to June inclusive	27

Fiscal Year 1919.

Reimbursement accounts (original), July	36
Reimbursement accounts (resubmitted items), July	9
Reimbursement accounts (original) August	108
Reimbursement accounts (original) September	11
Total	215

A letter was written to each employee when his account was examined, and suggestions made whereby he could prepare future accounts more accurately and completely. Numerous letters were written to hotels and individuals in connection with incomplete or inaccurate subvouchers, and many letters of explanation were written to the Office of Records. In all, 383 letters were written in connection with these 215 reimbursement accounts. That many of the men appreciated the suggestions made to them is shown by letters they have written in reply.

The long delays that have occurred in obtaining reimbursement are greatly regretted and everything possible is being done to avoid such delays in future. The information given to the men should result in accounts for the month of September being prepared much more accurately and completely. The office is now practically up to date with the work. Accounts are being handled within two or three days after their arrival. It is planned to revise and bring up to date the "Instructions to New Appointees," issued under date of July 23, and thus endeavor to insure a still better understanding of fiscal matters on the part of future field assistants.

REPORTING USE OF SCRIP.

Nearly all the men are now using universal scrip instead of the old style mileage. Many of the men in reporting the use of this scrip on the sheets furnished for mileage-use statements are not reporting the numbers of the scrip coupons detached by the conductor for each journey. This should be done just as it was done in the case of mileage. The only difference will be that the coupon numbers on the scrip coupons represent dollars and cents instead of merely consecutive numbers.

REIMBURSEMENT FOR PERSONALLY OWNED AUTOMOBILES.

Memorandum No. 252, regarding reimbursement on a mileage basis for use of personally-owned automobiles and motorcycles.

The attention of officers and employees of the Department is invited to the following provision of law contained in the Act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1919:

> "Whenever, during the fiscal year ending June thirtieth, nineteen hundred and nineteen, the Secretary of Agriculture shall find that the expense of travel can be reduced thereby, he may, in lieu of actual traveling expenses, under such regulations as he may prescribe, authorize the payment of not to exceed 2 cents per mile for a motorcycle or 6 cents per mile for an automobile, used for necessary travel on official business: PROVIDED, That there shall be no payment of mileage for the use or travel of motorcycle or automobile furnished or owned by or maintained by the Government of the United States."

Pursuant to the authority thereby vested in the Secretary of Agriculture, the following regulation covering reimbursement on a mileage basis for the use of personally-owned automobiles and motorcycles on official business is hereby promulgated, and all existing regulations in conflict therewith are amended accordingly:

> Whenever it is found that the expense of official travel will be reduced thereby, employees of the department, with the approval of the chief of their respective bureaus, may, in lieu of actual traveling expenses be reimbursed for the use, in the official business of the bureau, of their own motorcycles and automobiles at a rate not

exceeding 2 cents per mile for a motorcycle and 6 cents per mile for an automobile. Such rates within the aforesaid maximum rates must be fixed in advance of official travel and may be fixed to cover such use of the vehicle for such periods during the fiscal year 1919 as will be required, subject to cancellation at any time by the department. Nothing in this regulation shall prevent the hiring of motorcycles or automobiles from persons not in the employ of the department for single trips at prevailing rates.

Reimbursement accounts which include mileage charges for the use of personally-owned vehicles must be accompanied by a statement prepared in duplicate setting forth: (a) the date of travel; (b) the points between which performed; (c) the actual number of miles traveled; (d) the rate per mile and total charge; and (e) the hour of departure from and arrival at official station. Such statement must also be supported by a certificate clearly indicating that the travel was officially necessary, that the distances charged for are, to the best of the employee's knowledge and belief, correct, and that no public or regular means of transportation was available, or that such public or regular means of transportation could not be used as advantageously in the interest of the Government. The necessary forms for reporting this information may be had upon application to the Office of the Secretary

D. F. Houston,
Secretary.

JUL 29 1918 BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. October 10, 1918. No. 14
Field Station Issue
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PERSONNEL.

Howard Lee Derr, who was appointed as Field Assistant in the Smut Control Campaign on August 22 and assigned to duty in the Great Plains district, died of pneumonia on October 3, at Amarillo, Texas. He had been engaged in the work in Colorado, Kansas, and the Panhandle of Texas. His illness was of short duration. The body was brought home and interment took place at Fairfax Court House, Va., on Wednesday, October 9.

Howard had enlisted in the Army and served through the campaign on the Mexican border, being finally discharged because of having contracted tuberculosis. He later reenlisted but was again discharged for the same reason. His father, Harry B. Derr, was for several years Agronomist in charge of Barley Investigations in this office. More recently he was County Agent in Scott County, Mo., and at present is County Agent in Fairfax County, Va.

The sympathy of the office staff is extended to Mr. and Mrs. Derr and the surviving brother and sister.

FIELD STATION CONDITION AND PROGRESS, AUGUST AND SEPTEMBER, 1918.

HUMID EASTERN STATES.

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins)

August. A rain of 2.13 inches occurred on August 6, accompanied by very high winds. We were on the outer circle of the hurricane which did such fearful damage in and about Lake Charles where it is reported the wind reached a velocity of 120 miles. Little damage was done in this vicinity as most of the rice crop was young. Corn was blown down, however, and soy beans on the station were badly damaged.

During the latter part of the week beginning August 11, mosquitoes were so numerous that it was impossible to do much work in the fields. Some farmers were unable to harvest on account of them. In some places cattle were killed.

Good weather during the last week in August enabled farmers to progress rather rapidly with harvesting and thrashing of early rice. The question of labor is becoming more serious from day to day and the wages of farm laborers have been greatly increased. We are now having to pay $2.50 per day while last year much labor was secured for $1.25. A few weeks ago I saw Mexican labor removing weeds from the fields. Those employ-

ing Mexicans are well pleased with their work.

Rice on the station is very good, especially increase plats. Harvest was begun on August 29. The nursery rice is not as good as usual. This seems due to very hot weather during the early growth.

September. The harvesting of increase plats was practically completed during the week beginning September 15.

Rather bad harvest weather obtained during the last week of September. The temperature was low for late seeded rice, some of which is just heading, and showers and heavy fogs retarded harvest operations.

Auto trucks are being used in hauling rice from the field to the warehouse. This is made possible by good weather and gravel road paralleling the Southern Pacific Railway.

GEORGIA.

State Experiment Station (Athens) and Substations. (No report)

NORTH CAROLINA.

West Raleigh. (No report)

VIRGINIA

Arlington Farm, Rosslyn.

September. Total precipitation for the month was 3.15 inches. Of this 1.09, .63, and .62 inches occurred on September 18, 21, and 22 respectively. These rains were of material benefit to land that was being prepared for fall seeding.

Field and nursery plats of winter oats and barley were sown on September 25 and 26.

The preparation of seed for nursery sowings of wheat is in progress The sowing of wheat in field plats will begin in a few days.

The grain sorghums in the tri-local experimental plats were harvested on October 4. Birds did not eat and destroy this crop to the extent they have in previous years.

NEW YORK

Cornell Experiment Station, Ithaca. (Dr. H. H. Love)

August. Harvesting of all plots and hybrids was completed about August 23. Weather for the most part was very favorable to harvesting. Some of the nursery rows of oats were harvested rather late due to shortage of labor. However, very little loss was occasioned and the results will not be interfered with in any way.

Threshing of the increase plats has been completed and the following yields have been obtained from some wheat and oat selections:

Wheat		Oats	
Selection	Bu. per acre	Selection	Bu. per acre
Sel. 103-7 (From a natural hybrid)	32.9	Canada Cluster 110-36	66.0
507-3	31.6	Lincoln 109-15	64.6
Dawson Golderchaff 522-67	30.4	" 109 14	61.9
Lietz 105-5	30.2	Canada Cluster 110-7	57.5
Currell Prolific 111-9	29.8	Welcome 123-5	52.5
Dawson Goldenchaff 522-68	28.4	Silvermine 125-20	52.1
Klondyke 126-44	25.9	Clydesdale 114-14	49.0
Gypsy 7324 (Ohio)	25.9	Big Four 115-40	48.4
Fulcaster 123-32	25.4	" " 115-27	47.2
Klondyke 126-26	23.8		
Goldcoin 129-65	21.9		
Giant Squarehead 109-2	21.2		
Farmers' Trust 114-7	20.7		

The wheat yields are not high, owing to the severe winter which seriously affected some of our plats. In the nursery rows three replications of the rod rows were not harvested at all since the winter injury was so severe as to render the notes of little value in making comparisons between varieties and selections. Seven of the ten replications were harvested, however.

The new oat hybrids developed well and will furnish much material for notetaking during the winter. The season was favorable to color development so our color notes should be quite indicative of the behavior of the various colors so far as the hybrids under consideration are concerned.

The wheat hybrids are now being studied preparatory to making our fall planting for the coming year. In addition to the studies in heredity a number of very promising practical hybrids are being sorted out for trial. Some of the most promising sorts in the nursery last season were some of our new hybrid combinations. Two hybrids between emmer and common wheat were tested last season and came through the winter much better than does the Black Winter emmer parent. Both of these emmers are bronze chaff and one is completely beardless while the other segregated again this year for beardlessness, but it will be a simple matter to obtain pure breeding beardless forms from it

September. The threshing of wheat, rye, and barley is completed and nearly all of the oat threshing is finished up. The first part of September was given over to the weighing of the nursery rows and plats and getting seed ready for fall planting. Also considerable work was done with the hybrid wheat series in order to obtain seed plants for

seeding this fall. Wet weather has interfered considerably with the seeding having kept us out of the field most of the time for over three weeks. The seeding of hybrids will be completed October 4. Part of the rod row series of wheat was sown September 16 and since that time it has been impossible to make any further seedings. It is hoped that we will have enough dry weather to be able to complete the seeding by October 8 as after that time we do not feel it safe to sow, particularly where there is no seed held over for protection against the loss due to winterkilling. In most cases a reserve supply of seed has been held. This is not always possible in case of hybrids. Some seed has been received from the Minnesota station and will be sown. This is in connection with the rust problems. The threshing of the cooperative plats throughout the State was completed early in September.

The seeding of first generation hybrids and a considerable amount of other material will be made in the greenhouse in the next few weeks.

MISSOURI

State Experiment Station, Columbia. (No report) Mr. Lewis J. Stadler, who had charge of the cereal experiments at Columbia, resigned August 31 to enter the officers' training school at Camp Taylor, Louisville, Ky.

IOWA.

State Experiment Station, Ames. (No report).

GREAT PLAINS AREA.

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross)

August. Nearly all of the rainfall for August, which amounted to 2.2 inches, came at the end of the first week. Row crops were revived wonderfully and it seemed for about ten days or two weeks that the crop was assured but the hot weather without rain during the remainder of the month caused so much damage that it is doubtful if many of the fields in the country will make even rough feed. Rain is needed very much right now for the grass as well as for the cultivated crops.

A large part of the fall plowing on the station farm has been done since the rains of the first week in August.

September 14. The drought is cutting the crops shorter every day Birds are playing havoc with the crops that are far enough along to have seed on them.

Some of the sorghums have already been harvested because they drying and burning up. The grain yields on the grain sorghums will tremely light on account of the damage by drought and birds.

OKLAHOMA.

Woodward Field Station, Woodward. (John B. Sieglinger)

August. This month the broomcorn and most of the sorghums have been ripening rapidly and at present it appears that they will be in

the shock by the middle of September. The broomcorn already harvested consists of the first four dates in the date-of-seeding experiment, 11 plats of the varietal experiment, leaving one plat to harvest; and 9 plats of the rate-of-seeding and spacing experiment, leaving 11 plats to harvest. These will be harvested the first week in September.

Of the 19 varietal plats of the sorghums 9 are harvested. The milo rate-of-seeding and spacing experiment was harvested August 31. The first two dates of the date-of-seeding experiments with both kafir and milo have been harvested.

Mr. Rothgeb visited the Station on the 26th and 29th of August and gave some needed advice on the broomcorn work.

September. The month of September was rather cool and dry. The maximum temperature was 99°, on the 2nd and 14th, the minimum 35°, on the 20th. The precipitation for the month was 1.20 inches, of which .96 of an inch fell during the first half of the month. The ten-year average precipitation for September (1908-1917 inclusive) is 2.91 inches. The lack of moisture is felt by the farmers as it is delaying wheat sowing and may cause a decrease in acreage unless rain comes soon.

All of the sorghums and broomcorn with the exception of the last date-of-seeding plats are harvested. The milo rate-of-seeding and spacing experiments were threshed, also the first four dates of the milo date-of-seeding experiment. The results have not been computed as the grain has not been cleaned.

From the results I have figured it is certain that this has been the poorest year for broomcorn of the five years this station has been in operation. Though the yields were rather low, results of course were obtained for all experimental plats.

From what I can learn, the milo and feterita in the county will make fair grain, but the kafir will be very short on grain although it will make fodder.

I suspect that some of the results will be very interesting this season, especially the varietal and rate-of-seeding experiments with sorghums and broomcorn.

KANSAS.

Fort Hays Branch Station, Hays. (F. A. Kiene, Jr.)

August has had a number of rainy days but the rainfall has been light and the sorghum and feed crops have suffered. Kafir will make very little grain, but thin stands of feterita and milo will make fair grain yields. Sowed feed is very light, in many fields being completely dried up, and feed in rows is little better. There is only occasionally a field of corn that will yield any grain. This applies to Ellis county.

Trego and Gove counties have had more rain and the row crops promise very much better. In spite of the Government loan there will be much land unseeded in Gove county, due to the labor condition. This probably is best as this land really is not in fit condition for seeding.

Wheat in Ellis county is making about 12 bushels to the acre and about 54 pounds to the bushel.

Inasmuch as best yields and quality were secured from the earliest seeded wheat last season the farmers are inclined to seed still earlier this year. Some were found seeding in Trego county as early as August 20 so on August 24 I made a date seeding at rates of 1 to 5 pecks. I will make what ordinarily is my first seeding early in the first week of September. I will also harvest corn and some of the sorghums.

September. (No report)

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman)

August. Thrashing of field plats of winter wheat was completed August 3. The winter wheat yields were much above those of last year and the quality of the grain also was much better than in 1917. One plat of Kharkov, C.I.No.1583, yielded at the rate of 27.5 bushels per acre. In some plats the bushel weights ran as high as 62 pounds per bushel. Most of the thrashing of spring grain was completed August 22. It is believed that the yields of many of the varieties of spring wheat will be equal to the yields secured in 1917, but the plats of oats and barley yielded much lower on an average than they did in 1917. The highest yielding plats of the various grains yielded as follows:

Variety	C.I.No.	Kind of Crop	Acre Average	Soil Prep.
1. Kharkov	1583	winter wheat	27.5 bu. (60 lbs.)	fallow
2. "	"	" "	24.6 "	"
3. Kanred	5146	" "	24.4 "	(1)fallow (1)stubble
1. Galgalos	2398	spring wheat	17.9 "	fallow
2. Erivan	2897	" "	16.3 "	cornstubble
1. Albion	729	spring oats	437.5 lbs.	fallow
2. Sixty Day	165	" "	362.5 "	"
1. Hannchen	878	spring barley	900 lbs.	"
2. "	"	" "	875 "	"
3. White Smyrna	195	" "	775 "	"

Much of the spring oats and wheat was lost in the shock due to sprouting and to damage by birds. The loss was also very severe among many of the nursery bundles.

September. (No report)

Mr. Coffman has resigned from the Akron work as he expects soon to be called into military service. He left Akron on September 26 for his homestead in the Rio Grande Valley, one-half mile from Mack, Colo.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson)

August. All of the small grains are harvested save a few plats of late seeding in the date-of-seeding experiment. The corn has made good growth and is coming into the silage stage.

The early sowing of winter wheat was made on August 17 and was up in six days on the fallow land, while that sown on the oat stubble double

disked was not up on August 31.

September. The month has been one continual spell of wetness. There has not been enough dry weather between the cool, foggy, drizzly rains to fully dry out the shocks of grain. The fields are green with volunteer grain, especially where the hail hit the grain fields.

It has been a splendid fall for winter wheat. There is a great deal of moisture in the soil and the early sowings of August 17 are stooling.

The latest seedings of oats are still green. The latest seedings of wheat are ripening.

The work on the farm has consisted mostly of repair work on machinery, cleaning fence rows and pruning trees.

We are at present putting up silage, after which we will thrash.

All increase plats of grain have been stacked and the thrasher has been repaired.

SOUTH DAKOTA (Manley Champlin)

General.

August. Thrashing is in progress throughout the State and every hour during the weather which is dry enough is being utilized to the fullest extent. Grain quality will be reduced by the heavy rains which have occurred while the grain was in the shock. Yields will be excellent throughout the State except in isolated localities. Owing to the recent drop in the price of barley, I am told by some of the elevator men that very little barley is being received. Apparently farmers are becoming sufficiently prosperous so they no longer need to submit to the loss involved in marketing the crop at thrashing time when the price invariably drops due to the flooded market. The wheat harvest promises unusually high yields in most localities and as near as I can tell the Government regulation of prices is giving almost universal satisfaction among the farmers.

September. Cereal crop conditions have been unusually good on an average throughout the State this year. Quality of wheat is exceptional in most localities. Barley and oats are heavy but are frequently discolored due to rains while the grain was in the shock. Good yields of Swedish and Advance rye have been reported.

Brookings.

August. Frequent rains since harvest have discolored all of the grains in the shock and some of the durum wheat has been injured by scab which seems to have continued to develop even after the grain was cut. Crop yields are very good but the quality will not be as good as usual. Rust has developed considerably on the more susceptible varieties of wheat such as Preston.

September. Thrashing of all cereals is complete. Available winter wheat and rye seed has been distributed. Fall plowing is well under way and will be completed soon. Thrashing in the vicinity is nearly complete. Yields of cereals have averaged about as follows: wheat 18 bushels; oats 35 bushels; barley 30 bushels. Corn crop prospects are very good. Station bulletin 181 entitled "Corn Culture in South Dakota" has been distributed during the past month.

Cottonwood.

August. Shortage of help at Cottonwood continues to delay thrashing. Harvest has been completed by the aid of local business men who have worked at odd times. A hail storm injured some of the crops but was not serious except that it set back the corn and will prevent it from maturing as early as it otherwise would have.

September. Thrashing of increase fields of winter rye has been completed. Thrashing of experimental plats has been delayed on account of shortage of labor. It is hoped, however, that this work will be accomplished during the month of October. Fall plowing and fertilizing work is progressing. Crops in the vicinity are relatively good.

Eureka.

August. The drought was broken shortly after harvest by two good rains but there is still a shortage of moisture. Yields of cereals will be light but quality good. Even millet in cultivated rows failed to make seed this year which is very unusual.

September. Thrashing is completed and fall plowing is well under way. Yields of wheat vary from 0-20 bushels per acre, other cereals in the same proportion. Prolonged drought not only interfered with the success of the crops themselves but in many instances destroyed the comparability of the results of the experiments. A plat that happened to be favored, having more moisture for some cause or another, would frequently yield from two to ten times as much as a nearby plat which was not thus favored. The drought condition at Eureka is local, crops being good twenty miles south and east from the station.

Highmore.

August. A furlough was secured for Mr. E. S. McFadden who returned from Camp Lewis, Washington, to complete the thrashing of the cereal nursery, label the seeds to be reserved, and put them away where they can be kept securely until after the war. No plant breeding work will be attempted next season but every effort will be made to hold rotation, fertility, rate and date of seeding and other agronomic experiments intact and to avoid loss of any of the valuable strains in the plant breeding nursery.

September. Thrashing of cereals is completed. Fall plowing is well under way. During the month Mr. McFadden who was present on furlough for a few days completed thrashing and storing the seeds from the cereal breeding nursery. Mr. Janssen completed most of the work of cleaning and storing the seeds from the varietal experiments and other small experiment plats before being called to the colors on September 19.

Vivian.

August. Thrashing of the cereals is practically complete. Corn is in excellent condition. Fall seeding will be commenced immediately.

September. The silo has been filled and considerable seed corn selected during the month. There has been comparatively little demand for seed rye from Vivian but we are storing 7,000 pounds which will be available for next year's distribution.

NORTH DAKOTA.

North Dakota Experiment Station, Fargo (Theodore Stoa)

August. Harvest in this region is about over, and the next week should see threshing quite general. High temperatures of August 1, 2, and 3 ripened grain rapidly. Excessive rains during the last two weeks have delayed harvest and injured ripe grain to a certain extent.

The labor problem is serious, yet seemingly not. City people are responding and frequently give their time evenings to shocking grain in nearby fields. A large number of "shock troops" have been organized in Fargo. They furnish their own transportation to and from the fields. In most cases they ask no compensation for themselves. The farmer, however, contributes to the Red Cross fund what the assistance is worth to him. Farmers appear to be well satisfied with this labor and there are many calls for these groups. Both men and women make up the parties and they usually represent institutions or organizations about the city. A friendly but keen rivalry exists between the different groups.

Rains and increasing temperatures are aiding the corn. In the districts where drought was severe encouraging reports are given for the flax and forage crops.

September. Thrashing is almost completed in this vicinity. With the exception of a week during the latter part of August, the season has been especially favorable for consistent work. All grain yields in the Valley have been remarkably good. Corn suffered slightly from frosts early in September and a killing frost occurred on the night of the 16th when the crop had only reached a fair stage of maturity. Labor is much in demand and day wages approach $6 to $7 a day.

Northern Great Plains Field Station, Mandan. (J. C. Brinsmade, Jr.)

August. All of the flax has been harvested except the final seeding in the date-of-seeding experiment and a few hybrids and late seeded rows in the nursery.

All of the wheat, oats, and barley in the rotation experiments have been thrashed. The best yield of wheat was 28 0 bushels, from a manured, summer-fallowed plat, and the poorest 5.0 bushels, from a fall-plowed plat after wheat subsoiled in 1914 and 1915. The best yield of oats was 56.5 bushels, from a manured, summer-fallowed plat, and the poorest 16.9 bushels on fall plowing after wheat. The best yield of barley was 33.5 bushels on summer fallow, and the poorest 9.2 bushels on disked flax land.

A horticulturists' meeting was held at the station on August 22-24 inclusive, attended by representatives from North Dakota, South Dakota, Minnesota, Wisconsin, Montana, and other States, and from Canada.

September. The total precipitation for September was .63 of an inch; maximum temperature 87, on September 13; minimum temperature 32, on September 20.

All of the wheat, oats, and barley in the varietal experiments have been thrashed. A single plat of Acme wheat, which was especially favorably situated, yielded at the rate of 44.9 bushels per acre. Average yields of wheat in the replicated varietal experiments were as follows: Marquis 27.4 bu.; Arnautka 27.3 bu.; Power 26.1 bu.; Kubanka 25.5 bu.; Preston 21.9 bu.; Haynes 18.8 bu.

Average yields of barley were: Svanhals 28.8 bu.; Hannchen 27.8 bu.; White Smyrna 27.5 bu.; Coast 26.9 bu.; Mariout 24.9 bu.; Manchuria 19.4 bu.

Average oat yields were as follows: Golden Rain 40.9 bu.; Victory 38.8 bu.; Sixty Day 38.2 bu.; Swedish Select 37.5 bu.; Early Mountain 30.1 bu.; White Russian 18.6 bu.

Work at the station has been considerably delayed on account of the shortage of labor. All of the work that can be done inside is being left until after all of the field work has been cleaned up.

The plats sown June 15 in the flax date-of-seeding experiment were cut today. The flax nursery and single plats have not yet been thrashed, and the flax previously thrashed has not yet been cleaned.

A small nursery of winter wheat varieties sent here by J. A. Clark and L. E. Melchers was sown September 17. Some of the rows began to emerge several days ago but are making very slow growth as there has been very little warm weather during the latter part of September.

Dickinson Substation, Dickinson (Ralph W. Smith.)

August. Harvest is practically over in this vicinity, with the exception of flax, and thrashing is begun. It is expected to begin thrashing at the substation on September 2, using the new Ellis Keystone thrasher and a new 6 horse-power engine.

The seeding of about 500 nursery rows and 7 plat varieties of winter wheat was finished during the week. Most of the former were hybrids resulting from crosses made at this station between hardy varieties of winter wheat. The plat varieties were seeded in duplicate, being drilled in standing corn. One seeding in a date-of-seeding experiment with N.Dak. 959 rye was made August 31.

The station has recently been visited by C. W. Warburton and T. R. Stanton, Wm. L. Frank of the Office of Grain Standardization, Mr. Anderson of the Office of Grain Supervision, and Mr. Surratt of the Bureau of Crop Estimates.

September. The weather during the month of September has been dry and very favorable to thrashing, which is nearly completed in this vicinity. Yields of wheat vary from about 3 to 15 bushels per acre and rarely more. The average probably is between 5 and 8 bushels.

Work at the substation is progressing well without any regular laborers but with considerable help from business and professional men from town. On Saturdays high school boys are helping and last Saturday

five lady teachers from the high school gave valuable help in picking up potatoes.

The work of filling the silo is completed; corn, sunflowers, and mangels being used for the purpose.

Cereal varieties in plats are all thrashed except rye and flax. Yields are not yet computed. Individual plats of durum wheat yielded as high as 22 bushels per acre but the average is much less.

Winter wheat in plats and nursery is in excellent condition.

MONTANA.

Judith Basin Substation, Moccasin (N. C. Donaldson)

August. The weather during the last week of August was unusually fine and harvest operations in the Basin have progressed rapidly. Due to the labor shortage there has been considerable increase in the number of headers and combines being used. Many of the farmers who are using binders are experiencing difficulty in getting help enough to do the shocking. Quite a number of people from Lewistown and other nearby towns have been helping the farmers in the evenings and on Sundays.

On the station the spring wheat varieties in the replicate series have been harvested, also the spring wheat nursery and barley nursery in 8-rod rows. The flax varieties in replicate plats are ripe and will be harvested the first week in September. Oats and winter wheat on the rotation plats have been thrashed. The highest yielding plat of oats was 54 bushels per acre and the highest yielding plat of winter wheat 27 bushels per acre. Part of the increase field of White Smyrna barley has been thrashed. This is yielding between 35 and 40 bushels per acre.

September 16. The varietal experiments with winter and spring wheat, barley and oats have been thrashed and the winter wheat varieties have been seeded. Mr. Reddy arrived here on the 11th and got the winter wheat in the seed treatment series ready for seeding and these will be seeded tomorrow or next day.

Some fairly good yields have been obtained this year. Kharkov selection, C.I.1583-30, was the highest yielding winter wheat, yielding 28.4 bushels per acre. Kubanka, C.I.1440, was the highest yielding spring wheat, yielding 28 bushels per acre. Hannchen, C.I.531, was the highest yielding barley variety, with a yield of 53.3 bushels per acre. Silvermine, C.I.714, was the highest yielding oats variety, with 68.1 bushels per acre.

WESTERN BASIN AND COAST AREAS.

UTAH.

Nephi Substation, Nephi. (Aaron F. Bracken)

August. Thrashing of grain in this vicinity is now almost completed, which puts the farmers far ahead of their work as compared with previous seasons. Preparation for fall seeding is now beginning.

The fallow this year is very weedy due to unusually heavy summer rains.

During August harvesting of all grains was completed and thrashi almost finished. The yields of winter wheat varieties are as follows:

Variety	C.I.No.	Yield per acre
Beloglina	1544	23.28 bu.
	2097	22.30 "
Kharkov	1442	21.00 "
Armavir	1355	18.61 "
Bulgarian	2048	15.48 "
Crimean	1437	15.32 "
Odessa	3274	10.16 "
Winter Ghirka	1438	9.91 "
Koffoid	2997	8.31 "
	4326	6.72 "
Turkey	2998	5.44 "
Goldcoin	2996	2.17 "

All of the grain of Turkey, C.I.No.2998, and Koffoid, C.I.2997, wheat, grown on the station this year, that can be used for seed has been secured by nearby farmers. The increase field of Turkey, C.I.2998, which is free from mixtures has attracted considerable attention/

During the first part of the month an invitation was extended to everybody in this vicinity to visit the station. A number of prominent men accepted. All were surprised to know the extent of the work.

September. The following is the weather data for the month of September: Maximum temperature 91°, on September 17; minimum temperature 32°, on September 10; precipitation .33 of an inch, .66 of an inch, and .09 of an inch, on September 5, 23, and 24 respectively; average hourly wind velocity 2.9 miles.

Thrashing of all grains including nursery selections was completed September 2.

Fall soil sampling began September 2 and ended September 17. The soil was unusually dry to full sampling depth on all cropped plats. On fallow plats the stored moisture was about 12 inches below the surface of the soil.

During the month all grains reserved for fall and spring seeding have been cleaned and graded.

Preparation for fall plowing began September 13. All fallowe plats in general cultural methods reserved for experiments in winter varieties, rate-of-seeding, barn yard manuring, and green manuring have been harrowed and staked off. All plats in rotation and depth-of-plowing experiments and different cultural methods have received treatment according to permanent plan.

No fall seeding has yet been done. During September 23 and 24, .75 of an inch of rain fell but did not soak into the ground more than 3 inches, leaving a dry area of at least 5 inches between the moistur stored in the soil and that which had recently fallen. Under such conditions it was thought best not to plant at present. A number of farmers in this vicinity, however, are planting, but they are taking chances of failure if the seed sprouts and no more rain comes.

IDAHO

Aberdeen Substation, Aberdeen. (L. C. Aicher).

August. We have had excellent weather for harvesting and threshing. Precipitation has been very slight. Frosts on the 13th and 22nd of August nipped the potatoes severely in spots and injured all the beans. Corn in places was killed and in others was not even nipped.

Threshing on the farm, with the exception of flax, is all completed. Peas have yielded the highest average returns per acre this year since the crop has been grown on the station. The cereals did not do as well this year as usual.

Threshing in the vicinity of the station has begun and Dicklow wheat yields of 59 and 60 bushels per acre have already been reported. The farmers are exceedingly well pleased with this variety.

A letter just received from Director Iddings indicates that the farm surely will go under irrigation this coming season. Final decision has been left with the Board of Education, and Commissioner of Education, E. A. Bryan, has indicated in a recent letter that the station should be put under water. The farm will require considerable development work and it is hoped that the final work will be forthcoming at an early date that the leveling and ditching may be begun. In view of the attitude of the Director and the Commissioner, fall planting of the dry farm has been withheld.

OREGON.

Harney County Dry-Farming Substation, Burns. (John H. Martin)

August 16. Winter wheat and some of the spring wheat has been harvested. The irrigated wheat is partly ripe. Oats and barley on the irrigated land which had been eaten by grasshoppers has made a second growth and is heading again. Rye is also heading a second time, while the old culms which had been denuded of leaves and kernels are still standing. Early Baart wheat is filling well in spite of the fact that the leaves were entirely stippped from it by grasshoppers. Most of the awns were also chewed off at the same time which was shortly after heading.

The second cuttings of alfalfa and sweet clover are nearly mature.

A light frost occurred on the 12th which injured the more tender crops.

September. Threshing of the wheat on the station was completed last week. Early varieties of oats and barley which were consumed by grasshoppers in July have made a second growth and are now ripe. Practically none of the dry-land grains could be harvested this year and only part of that harvested was worth threshing. Maximum yields of wheat and rye on the dry land are about 2 bushels per acre. Wheat on farms in this vicinity is yielding from nothing to seven bushels per acre.

This autumn is unusually mild and alfalfa is still growing. A third crop of alfalfa will be secured on some of the farms, which is very rare for this region.

Showers amounting to about one and one-half inches have occurred during the past three or four weeks but the soil is not yet moist enough for fall seeding.

OREGON.

Sherman County Branch Station, Moro. (D. E. Stephens)

August. The yields obtained in the varietal experiments with winter and spring wheat, barley, and oats are given in the following tables:

Winter Wheat Varieties Grown in Triplicate Twentieth-acre Plats.

C.I.No.	Variety	Yield Bu. per acre	C.I.No.	Variety	Yield Bu. per acre.
4429	Local Turkey	27.3	1756	Turkey	25.1
2998	Turkey	26.8	5146	Kanred	24.1
5408	Triplet	26.7	1558	Turkey	23.6
4326	Hybrid 128	26.5	5149	Odessa x Turkey	23.3
1442-12	Kharkov	26.2	1442	Kharkov	22.9
5290	Fortyfold	25.9	1561	Theiss	22.6
2979	Alberta Red	25.6	2239	Beloglina	22.4
1437	Crimean	25.5	1355	Armavir	22.3
1571	Turkey	25.4	1438	Ghirka	22.2
4511	Hybrid 123	25.2	5535	Titanic	17.3
1569	Argentine	25.1			

The Local Turkey wheat this year gave the highest yield. For some unknown reason we got a considerably thicker stand of the Local Turkey and Turkey, C.I.No.2998, than we did of any other variety. I believe this is the reason why these two varieties gave the highest yields. The rate and date of seeding experiments show that our thickest sowings gave us our highest yields, notwithstanding the fact that the season has been an unusually dry one.

Spring Wheat Varieties Grown in Duplicate Twentieth-acre Plats.

C.I.No.	Variety	Yield Bu. per acre	C.I.No.	Variety	Yield Bu. per acre
4733	Hard Federation	21.3	2227	Chul	15.7
4734	Federation	21.0	4158	Marquis	15.0
2826	Bobs	18.5	1697	Early Baart	14.9
3036	Sonora	18.4	3663	Dicklow	14.7
2495	Talimka	18.3	2346-1	Saumur	14.7
2398	Galgalos	18.3	2404-1	Yantagbay	14.0
2200-1	Karun	18.3	1440	Kubanka	13.3
4068	Little Club	18.0	1516	"	13.3
2203	Koola	17.9	4067	Pacific Bluestem	13.0
2511-2	Ble Noir	16.0			

The Hard Federation is of exceptionally good quality. I believe the farmers in this section will like this wheat as it possesses many very desirable qualities such as early maturity, stiff straw, and tenacious glumes. We were rather disappointed because Early Baart gave such low yields.

Spring Barley Varieties Grown in Duplicate Twentieth-acre Plats.

C.I No.	Variety	Yield bu. per acre	C.I.No.	Variety	Yield bu. per acre
261	Mariout	29.0	937	Sandrel	21.7
531	Hannchen	25.0		Mariout x Leon	21.7
620-1	Himalya	24.8	190	Beldi	21.5
936	Tweoi	24.2	626	Coast	20.4
935	Peruvian	24.1	927	Odessa	19.0
537	Oderbrucker	22.9	906	Hanna	19.0
658	White Smyrna	22.8	691-1	Coast	18.8
702-1	Peru	22.3	187	Svanhals	18.4

Spring Oat Varieties Grown in Duplicate Twentieth-acre Plats.

C.I. No.	Variety	Bu.per acre.	C.I.No.	Variety	Bu.per acre
729	Sixty Day	40.3	165	Sixty Day	34.4
165-1	" "	36.9	134-1	Swedish Select	34.1
786	Richland	36.6		Victory	34.1
635	Siberian	36.3	459	Kherson	33.5
	Three Grain	35.7	681	Shadeland Climax	32.9
	Local	35.3	524-1	Great Northern	32.5
519	Danish Island	34.7	357-1		30.8

The yields are not especially high because the oats were sown a little too late to give the best results.

WASHINGTON

Adams Branch Experiment Station, Lind. (M. A. McCall)

August. Threshing has been delayed by a mishap to our engine which necessitated sending it to Spokane for repairs.

There has been just enough rain to interfere with combine harvesting and enough to spoil the grade of the wheat. Weeds have been very troublesome, thistles being worse than they have been for several years past.

Present indications are that we will be able to seed this fall and we are now preparing to do the early seeding in the rate and date-of-seeding experiments.

September. We have completed threshing. The yields obtained in the varietal experiments with winter and spring wheat are as follows:

Winter Wheat.

C.I.No.	Variety	Bu.per acre.
	Turkey Red	7.59
1442	Kharkov	7.38
	Turkey Red x Jones Fife	7.05
	Jones Fife	7.05
4512	Hybrid 128	6.83
5046	Kanred	6.60
4513	Hybrid 143	6.55
2239	Beloglina	6.21
1438	Ghirka Winter	6.05
5409	Winter Bluestem	6.16
1697	Early Baart	2.11
	Fortyfold	5.16
4156	"	4.05

Spring Wheat

C.I.No.	Variety	Bu. per acre
1697	Early Baart	6.88
2227	Chul	6.55
2203-2	Kcola	6.22
2826-1	Bolo	6.05
1596	Fretes	5.94
2398	Galgalos	5.94
2495	Talimka	5.88
	Bluestem x Chul	5.44
3641	Marquis	5.38
4324	Pioneer	5.16
	Chul x Bluestem	5.10
	Kubanka x Bluestem	5.00
4067	Pacific Bluestem	5.00

CALIFORNIA.

Plant Introduction Garden, Chico. (No report)

Rice Field Station, Biggs. (J. W. Jones)

August 29. We have had excellent rice weather during the past week. The maximum temperature has been about 100° each day.

The earliest varieties of rice on the station, in plats and nursery, are fully headed. Many of the somewhat later varieties are heading, while the latest varieties are well advanced in the boot and will start heading in just a few days.

The fight against water-grasses is still in progress on the station and there is ample to do each day.

On commercial fields, the variety known as Sue Hero has been fully headed for about a week to ten days. C.I.No.1600 is fully headed on some of the fields, while others are a little later in this respect. C.I.No.1564 is heading and is about one week later than No. 1600. Early Wataribune has been heading for several days, while Late Wataribune is just shooting a few heads at present. Indications are that yields will be good on new land, but considerably lower on old land. Most of the old land is badly infested with water-grasses and "cattails" and for this reason yields will be reduced materially

September. (No report)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

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Vol. 10. November 10, 1918. No. 15
Field Station Issue.

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FIELD STATION CONDITION AND PROGRESS? OCTOBER, 1918.

ERRATUM.

After the Field Station issue of October 10 had been mailed it was discovered that in some copies the position of pages 166 and 167 had been reversed so that 166 followed 167. Will those who keep the Cereal Courier on file please examine their copies of that number and place pages 166 and 167 in their proper position, if necessary.

HUMID EASTERN STATES.

LOUISIANA.

Crowley Rice Station, Crowley. (H. Mitchell Jenkins).

The total precipitation for the month was 10.36 inches. The greatest previously recorded for the month of October was in 1913 when we had 5.49 inches of rain.

During the first few days of the month the rice harvest went forward rapidly but the rain brought harvesting operations to a standstill. On the Station practically all rice had been harvested when bad weather began. The nursery, however, suffered to some extent. It could have been harvested in the rain as was done in 1913 but no one wanted to run the risk of contracting influenza. The nursery finally was harvested during the last week of the month with the exception of late-maturing varieties.

Much damage was done to rice in the shock due mainly to the sprouting of grain in cap bundles. The damage is estimated at from 10 to 25 percent.

Farm operations were held up during the entire month. Threshing was resumed on the 30th.

A fresh coat of paint is being applied to all Station buildings.

GEORGIA.

State Experiment Station (Athens) and Substations. (Professor Loy E. Rast)?

All land is prepared and plots have all been staked off at the main station at Athens, Georgia. Varieties of wheat in hundredth-acre plots have all been seeded and are up to perfect stands. This also is true of our experiments with different dates of seeding, which include Georgia Red and Fulcaster wheat and Appler and Fulghum oats. The October 15 seeding is the only one so far made. Rod rows of oats and barley varieties in plots have been sown. All of these are up, and with an exception of a few rows of oats sown with old seed are perfect stands. All of the seeding would have been completed here except for heavy rains almost daily for the last week. Remaining areas will be seeded as soon as the land is sufficiently dry to work.

NORTH CAROLINA.
West Raleigh. (No Report)

VIRGINIA
Arlington Farm, Rosslyn.

The rather unusual warm weather which obtained throughout October was very favorable to winter grains. Practically all of the various sowings of winter wheat, rye, oats and barley emerged quickly and have made excellent growth. In fact, winter oats and barley have obtained a better stand on the farm this fall than they have for a number of years.

The early sowing of wheat, sown September 17, and of rye, sown about a week before that date, are badly affected by leaf rust. The later sown plats are not so much affected.

Fall seeding was completed on November 1, on which date the sowings in the seed treatment - seed injury experiments were made.

During the month much progress has been made in the weighing and storing of grain and in the recording of yields and other data from nursery experiments.

NEW YORK
Cornell Experiment Station, Ithaca. (Dr. H. H. Love)

Owing to the wet weather the seeding of the rod rows in the wheat nursery was not completed until the 4th of October and the seeding of the hybrid wheat series was not completed until the 1st and 2nd of October. Favorable weather since then, however, has aided the seeding so that the plants are now making a good growth and should come through the winter unless the winter is too severe. In the wheat nursery were sown a large number of new hybrids sent to us by Dr. Leighty as well as a large number of our own hybrids. This is the first time these have been tested here to determine their practical value. In addition to these, some seed which had been grown and developed at the Plant Introduction Garden at Chico, was sown here for the first time.

In order to test certain of our new selections, some rod rows and plats were sown in Ontario and Livingston counties and some plats in Niagara County. These sections represent the wheat districts better than does the experiment station farm at Ithaca. During the last summer a large number of new head selections were made while Dr. Leighty was here with us studying the wheat conditions in New York State. Some of these selections were sown in a head-row series on the grounds at Ithaca and others in the three counties mentioned above.

The rye-selection work which was begun last year in Albany County by growing a large number of head selections, is being continued there by carrying the best head selections into rod rows. In addition to this work new head selections have been sown in Columbia and Schoharie counties. These three counties represent the rye-growing area of New York State. Plats of certain commercial sorts were sown in order to make comparisons between these commercial sorts and the new productions.

Owing to the shortage of coal it is planned not to heat all of the greenhouse space at our disposal and as an experiment one complete house which is to be cold throughout the winter has been sown to wheat hybrids of various sorts, mainly species hybrids, as well as varieties which may be used for crossing. This is an experiment and may not prove very satisfactory so far as growing wheat of the less hardy types is concerned. In the same house, during the warmer weather we are having at present, we are testing a large number of oat seedlings to determine the inheritance of ligule.

We are just sending wheats to Chico, California, for sowing there. This material consists mainly of seed for half-rod rows. This seed has come from promising plants and the experiment is planned to determine whether any of these sorts have practical value. In addition to these, seed of our hybrid series was sent for the purpose of testing second generation hybrids and certain other plants.

At the present time we are engaged in laboratory work, studying the characters of wheat and oat hybrids, and work of similar nature.

MISSOURI
State Experiment Station, Columbia. (No Report)

IOWA
State Experiment Station, Ames (No Report)

GREAT PLAINS AREA.

TEXAS
Amarillo Cereal Field Station, Amarillo (John F. Ross)

The weather data for October is as follows: Maximum temperature 96, on the 5th, minimum 23, on the 27th; precipitation 2.24, most of which came during the last week, partly as snow; average hourly wind velocity 7.4 miles. The total evaporation for the month is not given as the snow and ice on the tanks made it impossible to get the readings correctly during part of the last week.

The rainfall, beginning October 20, has wet the soil to a depth of about 8 inches in the sod and as much as 12 inches on cultivated land. Though it is somewhat late, thousands of acres of wheat will now be sown over the Panhandle.

OKLAHOMA
Woodward Field Station, Woodward, (John B. Sieglinger).

Oct.15. Thus far in October the weather has been pleasant but very dry. It has been almost ideal for thrashing, but bad on prospects for thrashing any great amount of wheat next year. The soil is very dry and there is no use to sow wheat until we get a rain. Farmers who have wheat up report that grasshoppers are destroying it.

With the exception of about one-half of the plats in the varietal experiments plats and some of the plats in the date-of-seeding experiment, the cereal sorghums are thrashed. The remaining plats will be thrashed as soon as they are ready. The plat of the last date is not harvested yet.

Mr. Sieglinger entered officers' training school at Camp Taylor, Louisville, Ky., on October 22nd.

KANSAS
Fort Hays Branch Station, Hays (E. A. Kiene, Jr.)

Oct. 22. Grasshoppers have done a great deal of damage on the Station and in this district. A false wireworm also is working on the germinating grain.

As I was sick with influenza for about 12 days, I was not able to sow the varietal experiment and the seed treatment experiment until last week. Seeding was finished on October 20. The nursery had been seeded during the last days of September after a light rain. The rate and date of seeding experiments were not interrupted. I consider it well that the main seeding was delayed. A fields on the station are spotted due to uneven germination and margins are badly eaten off. A rain recorded this morning amounting to .26 of an inch will improve conditions slightly. During the five months June to October, inclusive we have had 6.96 inches of rain; 6.44 inches less than normal. The highest

he still in an unsettled condition.

he still in an unsettled condition.

daily precipitation for the period was .74 of an inch. Ground [illegible] in June is still in an unsettled condition.

COLORADO
Akron Experiment Farm, Akron. (No Report).

WYOMING
Cheyenne Experiment Farm, Archer (A. L. Nelson).

The fore part of the month was cool and wet. During the first week the two silos for the dairy barn were filled. The next week was spent in thrashing and plowing rotation plats.

The weather has been very unsettled during the latter half of October. There has been considerable rain, snow, fog and low temperatures, the lowest temperature being 19 degrees. These conditions prevented threshing a considerable part of the time.

The potatoes have been dug and sorted. The yields were very good, the highest yield being 330 bu. per acre. This from the Late Ohio variety. On the whole the quality was very good.

The corn also was harvested, husked and sorted during the wet weather. We have a splendid supply of seed corn for next year.

All of the wheat, oats and barley on the plats of the Office of Dry Land Agriculture have been thrashed, also the winter wheats on the Cereal Investigations plats, the highest yields nearing 50 bu. per acre.

SOUTH DAKOTA (Manley Champlin)

General: The months of September and October have been dry and relatively warm and very favorable to farm operations. If unfavorable weather had prevailed, it would have been practically impossible to complete the threshing of the crop and fall plowing. As it is there is a large acreage of fall plowing yet to be done. With favorable weather during November, it may be possible to complete the fall work before winter sets in. Crops have been good in general throughout the state.

Brookings: Threshing and fall plowing have been completed as well as husking corn from all experimental plots. Cleaning of the cereals is now in progress.

Yields of Wheat at Brookings

Variety	S.D.No.	C.I.No.	Yield
Hard Red Winter			
Turkey	144	3689	44.2
Kharkov	191	1442	45.0
Turkey	1137		22.5
Hard Red Spring			
Prelude	1021	4323	22.5
Marquis	515	3641	23.3
Preston	67	3081	15.4
Pioneer	1022	4224	22.5
Ghirka Spring	69	1517	15.8
Glyndon	163	2873	15.4
Power	1039	3697	16.0
Haynes	169	2874	10.0

Variety	S.D.No.	C.I.No.	Yield
Durum			
Arnautka	1001	4064	25.8
Pierson	999	4163	30.[illegible]
Castilione	1132	5539	25.8
Kubanka	75	1440	30.
Acme	284	5284	33.[illegible]
L 5	1112	3322	30.[illegible]
Monad	1113	3320	30.[illegible]
Yellow Gharnovka	121	1444	34.2
Sloat	1158	6046	28.8
Buford	1159	5295	25.8
Mindum	1160	5296	32.5

Cottonwood: Two additional men were secured about the 1st of the month and Mr. G. A. Yoder was transferred temporarily from Vivian so that the threshing could be completed. Threshing is now well under way and it is hoped will be completed before bad weather sets in. The month has been dry and warm up to the last few days. Fall plowing and fertilizing are well under way.

Eureka: All fall work is practically completed and the cleaning of spring grains is nearly done.

Highmore: All of the fall work is complete except part of the corn picking and a small amount of plowing and manuring. Cleaning of the grain will be continued during November. Only two men remain at Highmore, foreman S.W.Sussex and Mr. Wm. Loser.

Yields of Wheat at Highmore

Variety	S.D.No.	C.I.No.	Yield	Variety	S.D.No.	C.I.No.	Yield
Hard Red Spring				Durum			
Power	1039	3697	20.8	Yellow Gharnovka	121	1444	21.6
Haynes	169	2874	20.0	Acme	284	5284	20.0
Marquis	515	3641	19.2	Pierson	999	4163	19.2
Preston	67	3081	19.2	Monad	1113	3320	18.5
Pioneer	1022	4324	12.5	Sloan	1158	6046	17.5
Prelude	1021	4323	9.2	Arnautka	1001	4064	15.0
				D 5	1112	3322	12.5
				Kubanka	75	1440	11.6
				Algeria	340	3330	

Vivian: Corn picking and fall plowing have progressed during the month. It is expected that nearly all of the outside field work will be completed this month, including threshing of sweet clover and fall plowing.

NORTH DAKOTA
State Experiment Station, Fargo. (Theodore Stoa)

Results from Flax Experiments in Duplicated Plats on Corn Ground, at Fargo, N. D.

Table 1. Individual and average plot yields obtained in Rate-of-Seeding experiments, with probable error.

Rate in Pecks	Plot per acre - Bushels Plot 1	Plot 2	Average	Probable Error
1	20.9	20.2	20.5 bu.	.33
1.5	22.4	21.3	21.8 "	.50
2.0	23.8	21.1	22.4 "	1.18
2.5	23.3	21.0	22.1 ¾"	1.01
3.0	23.5	20.5	22.0 "	1.26

Table 2. Individual and average plat yields obtained in Date-of-Seeding experiments, including probable error.

Date Sown	Yield per acre - Bushels Plot 1	Plot 2	Average	Probable Error
April 9	10.9	12.3	11.6 bu.	.59
" 20	15.3	14.4	14.8 "	.42
May 1	19.2	21.0	20.1 "	.76
" 10	20.0	2003	20.1 "	.12
" 20	18.4	18.7	18.5 "	.12
" 30	17.1	17.2	17.1 "	.04

Table 3. Individual and average yields obtained in tillage experiments, including probable error.

Date of Tillage, Double Disking.	Date Seeded	Yield per acre - bushels Plot 1	Plot 2	Average	Probable Error
5/9	5/9	20.0	20.3	20.1	.13
5/1, 5/9	5/9	18.2	19.2	18.7	.42
5/20	5/20	18.4	18.7	18.5	.13
5/1, 5/9, 5/20,	5/20	17.5	18.1	17.8	.25
5/30	5/30	17.1	17.2	17.1	.04
5/1, 5/9, 5/20, 5/30	5/30	16.6	16.3	16.4	.13

Northern Great Plains Field Station, Mandan (J.C.Brinsmade,Jr.).

The weather during the first half of October was mild and warm. The last half of October has been generally cold and cloudy, though there has been very little rain. Maximum temperature for the month was 78°, recorded October 12, minimum 14°, recorded Oct. 28. Precipitation was as follows: traces on Oct. 7, 18, 19, and 29; .26 of an inch on Oct. 24, and .01 of an inch Oct. 30, making the total precipitation recorded for October .27 of an inch.

The single plats of flax varieties have been thrashed and the seed from the date- and rate-of-seeding and replicated flax plats has been cleaned, but yields are not yet computed.

The regular work of the Station has been interferred with on account of the difficulty in filling temporarily at this time the positions of those who were laid up with "Spanish" influenza, and the necessity of caring for the sick. There were nine cases among the regular station force, including the agronomist, foreman, mess cook, chore man, carpenter, one teamster and three shelterbelt men. Since the station was already very short handed the work was severely crippled for a time. All of the influenza patients at the station have recovered and working conditions are again nearly normal, though some of the patients have not their full strength back yet. New cases are still being reported, however, in town and in the surrounding country.

Dickinson Substation, Dickinson (Ralph W. Smith).

During the past month the weather has continued dry with very little stormy weather to interfere with outdoor work. The precipitation for the month was .55 of an inch. Since the beginning of September only .89 of an inch has fallen. The ground is quite dry and fall grain sown since the middle of September has a very thin stand. Winter wheat varieties in plats and nursery look fairly well except where eaten off along the borders by grasshoppers.

All thrashing was completed about two weeks ago and the work of weighing and cleaning seed of all varieties in plats and nursery has just been completed. The yields of varietal plats are given below. The yields of oats and barley were much reduced by the injury from grasshoppers.

Spring Wheat Varieties in Duplicated 32nd-acre Plats at Dickinson, N. D.

C.I.No.	Variety	Yield (Bu.per a.)	C.I.No.	Variety	Yield(Bu.per acre
	Common			Durum	
4414	Ghirka No. 5	19.4	3322	D - 5	20.2
1517	Ghirka	18.3	4663	Kubanka No.8	18.6
4788	Kubanka Bluestem	17.4 *	1440-98	Kubanka-98	18.2 *
3022	Rysting	16.9	5284	Acme	17.8
2873	Glyndon	15.6	4064	Arnautka	16.2
2874	Haynes	14.3	1440-58	Kubanka-58	16.0 *
3697	Power	14.1	1440	Kubanka	15.7
3641	Marquis	14.0	3320	Monad (D-1)	14.6
4324	Pioneer	13.9	5296	Mindum	14.6 *
3315	Huron	13.3	5295	Buford	13.2 *
4789	Kubanka x Preston	13.0*			
3329	Red Fife	12.8			
4323	Prelude	12.5			
3314	Crossbred	11.4			
3081	Preston	11.3			

* Only one plat of these varieties.

Oat Varieties in Triplicated 32nd-acre Plats.

C.I.	Variety	Yield (Bu. per acre)
493	Golden Rain	49.5
358	---	44.3
445	White Tartarian	41.2
754-11	Early Mt. No.11	40.3
659	Silvermine	39.7
160	Banner	39.6
754-8	Early Mt. No.8	38.7
	Lincoln	38.7
741	Siberian	37.6
658	Big Four	36.4
336	Belyak	36.2
134	Swedish Select	34.4
560	Victory	34.1
787	Richland (Iowa 105)	33.9
731	Abundance	33.6
729	Albion (Iowa 103)	33.5
165	Sixty Day	32.3
456	Thorson	31.2
551	White Russian	27.8
656	Early Mt. No.2	27.5*
1526	Yaroslav Emmer	19.8**

* Badly injured by grasshoppers because of location on outside of field.

** Very badly injured. Yield computed at 32 pbs. per bushel for comparison.

Barley Varieties in Triplicated 32nd-acre Plats.

C.I.	Variety	Yield (Bu.per acre)
907	Steigum	23.6
932	Mariout	22.8
375	Gatami	22.2
658	White Smyrna	20.4
203	Hanna	16.5
663	Chile	15.9
863	Manchuria	14.9
[illegible]	Hannchen	14.8
1147	Moreland (Wing's Selection)	13.8
187	Svanhals	13.3
262	Nepal	9.7*

* Yield estimated at 48 lbs. per bushel for comparison with other varieties

MONTANA

Judith Basin Field Station, Moccasin (N.C.Donaldson)

Oct. 16. Work at Moccasin was finished October 14.

Weather conditions at Moccasin for the past month have been very favorable for the growth of winter wheat. Good stands were obtained on all plots and they have made good growth.

WESTERN BASIN AND COAST AREAS

UTAH

Nephi Substation, Nephi. (Aaron F. Bracken)

The fall conditions for winter grains have never been better. All of the grain has been sown in this section and at least 95 per cent of that sown has emerged.

Seeding on the Station began October 7 immediately after a rainfall of .75 of an inch, and was finished October 30 Most of the seeding was done during the week October 7-12, inclusive, and this grain has emerged with good prospects for successful yields next year.

During the month all seeding has been done; potatoes in both rotation and varietal experiments have been dug, and preparation of land for all experiments has been finished. In fact, all the work is now done except clearing the farm of a few weeds.

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher)

The weather has been very good in this section for this time of year. For the most part warm weather has prevailed and fall wheat which was sown in September or early in October came up nicely and is now looking well. The dry-farm district has been particularly favored with fall rains this year.

Beet harvest has been infull swing here for the past four weeks and should be over within two weeks, Yields will average about 12 tons per acre.

The dry-land part of the Station is now being leveled and ditched preparatory to putting it under irrigation. The potatoes on the irrigated farm this year yielded over 500 bushels per acre.

Labor is scarce and hard to get and wages are high. We have been running short-handed for some time.

OREGON

Harney County Dry-Farming Substation, Burns (No Report)

Sherman County Branch Station, Moro (No Report)

WASHINGTON

Adams Branch Experiment Station, Lind (No Report)

CALIFORNIA

Plant Introduction Garden, Chico. (Victor H. Florell)

Oct. 30. During the past week, land for the cereal crops has been plowed and the seed bed promises to be in fairly good condition. Heavy rains fell two to three weeks ago. Continuous dry weather has prevailed since then and unplowed fields are becoming dry and hard.

Cereal crops for both nursery and field have been weighed in preparation for planting. It is planned to begin seeding between November 10 and 15. The sorghums in the environmental experiment have been harvested.

"Amber Saccharine" broomcorn was fully ripe on October 10and was harvested on the same date. The "Golden Saccharine" Broomcorn is ready to harvest. The quantity of juice and saccharinity of the latter variety were fully equal to that of the common Black Amber sorghum. The former variety was slightly less saccharine, and the larger stalks were slightly pithy occasionally. The brush of the Amber Saccharine" variety was coarse while that of the "Golden Saccharine" variety was fine and of good quality.

Rice Field Station, Biggs (No Report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S.Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10. November 30, 1918. No. 16.
Miscellaneous Issue.

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The pressure of our emergency work has not permitted prompt or regular issue of the Courier. For this reason, some of the following items about the personnel may seem old "news", but probably are still news to many of the widely scattered field force.

PERSONNEL (AGRONOMIC PROJECTS)

Henry P. Ames was appointed Field Assistant, effective October 2, to take charge of the cereal work at Arlington Farm, Va., for a temporary period. Mr. Ames is a graduate of Maryland Agricultural College and during the summers of 1914 and 1915 assisted in the experimental work at Arlington Farm.

Charles A. Mooers, Chemist and Agronomist at Tennessee Agricultural Experiment Station, has been appointed Collaborator, effective November 16.

Guy Owen, who served during the summer as laborer at the Amarillo Cereal Field Station, resigned September 11 to return to his school studies.

Merritt N. Pope, Assistant in Barley Investigations, arrived in Washington on October 11, which was his first appearance in the office since his appointment on June 10 of this year. During the summer months he studied the barley nurseries at Aberdeen Substation, Aberdeen, Idaho, and University Farm, St. Paul, Minn. Mr. Pope and his family have made their home at Cherrydale, Va.

John B. Sieglinger, in charge of cereal experiments at Woodward, Okla., entered the officers' training school at Camp Taylor, Louisville, Ky., on October 22. After the signing of the armistice he was able to obtain his discharge and reported for duty at Woodward on December 1.

Transfers Affecting Cereal Investigations.

W. D. Griggs, for several years Superintendent of the Dalhart Field Stationof the Office of Dry Land Agriculture, Dalhart, Texas, was transferred to the States Relations Service October 1 to accept the position of County Agent for Pike County, Mo. (Weekly Station Reports of the Office of Dry Land Agriculture Investigations, Sept. 28, 1918).

J. E. Mundell, formerly Superintendent of the field stations of the Office of Dry Land Agriculture at Tucumcari, N. M., and Big Springs, Texas, has been onfurlough for some time. He returned to duty October 1 and is stationed at the Amarillo Cereal Field Station for the remainder of the season where he succeeds Mr. L. N. Jensen in charge of investigations of the Office of Dry Land Agriculture. (Weekly Station Reports of the Office of Dry Land Agriculture Investigations, Sept. 28, 1918).

PERSONNEL (PATHOLOGIC PROJECTS)

REGULAR PROJECTS.

Ruth Guenn Brandenburg has been appointed Stenographer-Typist, effective November 4, in connection with the cooperative corn disease work at Purdue University.

Dr. Ralph Howard Carr, Professor of Agricultural Chemistry at Purdue University, has received appointment as Agent, effective November 1, in connection with the corn disease investigations conducted cooperatively by this office and Purdue University Agricultural Experiment Station.

Dr. A. G. Johnson, Associate Professor of Plant Pathology at Wisconsin College of Agriculture, and Agent in Cereal Disease Investigations, has just received appointment, effective October 1, as Pathologist in this office. He will have charge of all work concerned with the diseases induced by fungi imperfecti and sac fungi. This includes the investigations of Fusarium, rots of corn, ergot, flax diseases, the Helminthosporium diseases of barley, oats, and wheat and the "wheat-sick" soil problem.

Mrs. Pansy McKinney has been appointed Stenographer-Clerk, effective November 12, for service at Madison, Wisc., in connection with the cooperative cereal disease work being conducted there.

Charles S. Reddy, now in charge of the Seed Treatment-Seed Injury investigations, returned to the office on October 26 after two months' travel in the interests of this work. The principal purpose of the trip was to obtain the cooperation of experiment stations, both Federal and State, in carrying the Seed Treatment-Seed Injury work into the field. Mr. Reddy directed the sowing of field plats at several experiment stations with treated seed to determine the effect of different treatments on germination of smutted grain. This experimental work is now in progress at the following experiment stations: Arlington Farm, Va.; Ithaca, N. Y.; Manhattan and Hays, Kans.; Amarillo and Denton, Texas; Moccasin, Mont.; Lind and Waterville, Wash.; Moro and Corvallis, Oreg.; and Davis, Cal. By conducting these experiments at so many stations fairly reliable data will be obtained in one year, which is more desirable than having the experiments conducted at one station through a number of years. On Sept. 5 Mr. Reddy left Washington to supervise this work at the various stations and will return at the end of December.

Dr. R. D. Rands wrote under date of September 26 that he was then aboard the Netherlands S. S. "Vondel" passing through the Inland Sea of Japan on the final lap of his journey to the East Indies, and would arrive at Batavia about October 7. Dr. Rands, formerly in charge of the investigations of scab and other diseases of wheat, has been appointed by the Government of Holland to investigate the diseases of rubber plants in Java. His address will be Instituut voor Plantenziekten, Buitenzorg, Java.

Glenn M. Smith, of the Horticultural Department of Purdue University has been appointed Collaborator, effective October 1, to assist in the corn disease work being conducted at Bloomington, Ill., in cooperation with the Indiana Experiment Station.

Charles Elmer Owens has been appointed Plant Pathologist, effective October 20. He will take charge of the cereal rust experiments being conducted at Corvallis and other points in Oregon by this office in cooperation with the Oregon Agricultural Experiment Station. Mr. Owens is a grad-

uate of the University of Indiana where he also received the degree of A.M. He has been instructor in plant pathology at the Oregon Agricultural College for a number of years.

Dr. Wendell H. Tisdale, State Plant Pathologist of North Carolina, has been appointed Collaborator, effective November 11. Dr. Tisdale formerly was in charge of investigations of the Physoderma disease of corn in this office

EMERGENCY PROJECTS

Barberry Control Campaign

Dr. E.D.Ball has resigned his position as State Entomologist of Wisconsin and accepted the position of Professor of Zoology and Entomology at Iowa State College.

W.H.Ballamy has been appointed Field Assistant effective October 16. His headquarters will be Bay City, Mich. Mr. Ballamy is a graduate of Michigan Agricultural College and for some time has been employed as plant pathologist by the Illinois Central Railroad.

Ray E. Bassett has been appointed Assistant Pathologist, effective November 14, with headquarters at Ann Arbor, Mich. Mr. Bassett is a graduate of the University of Michigan.

Bret E. Cooley has been appointed Field Assistant, effective October 22, and will work on a part-time basis with headquarters at St. Paul, Minn. Mr. Cooley is a high school teacher in St. Paul. During the summer he was employed by the State of Minnesota to assist in the barberry work.

Raymond Frank Crawford has been appointed Field Assistant, effective November 5, on a part-time basis. He is a senior student in Iowa State College at Ames, Iowa.

G.D.George, who has been assisting in the publicity work of the Barberry Campaign was in Washington November 9 to 15 for the purpose of submitting designs for the proposed new barberry poster, cartoons, postal cards, and other publicity matter. Arrangements were made also for the preparation of colored plates to illustrate the proposed barberry bulletin, and for an animated cartoon to be reproduced as a moving picture. Mr. George will return to Washington a little later to prepare this animated cartoon.

Wright L. Hess, Field Assistant, has resumed his studies at the University of Wyoming but will continue in the barberry work on a part-time basis.

C.A.Ludwig, formerly a Field Assistant in the barberry campaign, was at the Ordnance Training School, Aberdeen proving ground, Md., according to a letter received from him under date of October 18.

M.A.Nichols has been appointed Field Assistant, effective October 22, and will work on a part-time basis. Mr. Nichols is an instructor in the State Normal School at Mankato, Minn. He is a University of Illinois man.

Wm. H. Smith, of Alamo, Mich., has been appointed Field Assistant, effective November 16.

Lloyd A. Spencer, Field Assistant, has resumed his studies at Michigan Agricultural College but will continue to give part of his time to the barberry work.

Wilbur H. Thies, formerly Field Assistant in the barberry campaign, says, in a letter dated October 28, that he has been transferred from the 160 Depot Brigade, Camp Custer, Mich., to Company A, 214th Field Signal Battalion Camp Custer, Mich.

Smut Control Campaign

A.L.Bakke, who served during the summer as Assistant Pathologist i the smut control work, resigned September 30 to return to his work as Profess of Plant Physiology at Iowa State College.

J.P.Bennett, Field Assistant, resigned effective October 2. He is now employed in the Office of Cotton and Truck Disease Investigations.

J.H.Brown, Field Assistant, resigned October 16, and has returned his home in Evanston, Ill.

Hugh Coleman, Assistant Pathologist in the work in Washington duri the summer, resigned September 6 to return to teaching at Albion, Wash.

Bliss F. Dana, Assistant Pathologist, resigned October 1 and retur to his work as Assistant Plant Pathologist at the State College of Washington

C.J.T.Doryland, Field Assistant, resigned November 8 to return to his studies at Yale University, where he is studying for a doctors degree.

Sylvia C. Fuson has been appointed Field Assistant on a part-time basis, effective October 3. She will do laboratory work at Columbus, Ohio, i connection with the smut control campaign. Miss Fuson is a graduate of Miami University, Oxford, Ohio, and is at present working for a master's degree in plant pathology at that University.

G.W.Martin, Field Assistant, resigned September 22, and has return to his work as professor in the Biology Department of Monmouth College, Monmouth, Ill.

Homer H. Plagge, Assistant Pathologist in the Smut Control Campaig in the West Central District, resigned September 30 to resume teaching at Iow State College.

Fred E. Robbins, Field Assistant, has returned to his work as Assi ant Professor of Crop Production at Purdue University, Lafayette, Ind.

John W. Taylor, who was on our Smut Control Campaign in the summer months has written recently from the Block Island Naval Radio Station where h has been for some time.

James L. Thompson, Assistant Pathologist in the smut control campa resigned September 17 to become principal of Kittitas Union High School, Kitt tas, Wash.

Henry W. Thurston, Jr., Field Assistant, resigned November 11.

A.E.Waller, Assistant Pathologist, has returned to his teaching work at Ohio State University but will continue to assist this office on a part-time basis.

Hill Williams, Field Assistant in smut control work, resigned August 31 to accept a teaching position.

Harry C. Woodham, Field Assistant in the Smut Control Campaign in Oregon, resigned September 13 to accept a teaching position at Selma, Calif.

Transfers of Smut Control Workers.

Morgan T. Binney,	transferred	Oct. 1	to Corn Root and Ear Rot Investigations.
F.F.Blaine,	"	Nov. 14	" Barberry Eradication.
R.A.Carroll,	"	" 16	" " "
Justus J. Champlin	"	Oct. 16	" Corn Rot Investigations.
George H. Gillespie	"	Nov. 16	" Barberry Eradication.
M.C.Gillis	"	" 21	" Corn Disease Work.
K.M.Fradenburg,	"	" 21	" Barberry Eradication.
David Q. Grove,	"	Oct. 16	" Corn Rot Investigations.
F.R.Heath	"	Nov. 20	" Barberry Eradication.
Leroy Hoffman	"	" 19	" Corn Investigations.
R. A.Langenbacher,	"	" 20	" Barberry Eradication.
M. L. Lewis	"	" 1	" " "
Hervey A. Lyon,	"	" 16	" " "
Walter F. Reddy	"	Oct. 16	" " "
H. K. Vance,	"	Nov. 1	" " "
C.P. Winn,	"	Nov. 16	" " "
Wilmer W. Wood,	"	Nov. 1	" " "

PERSONNEL (CLERICAL STAFF)

Alpha E. Myers became a part of the office personnel on November 6 under appointment as Stenographer and Typewriter. Miss Myers is a graduate of Illinois Wesleyan Academy and University.

The women of the office were able to render valuable service during the epidemic of influenza. In response to an appeal from Department and Bureau officials many of the girls volunteered to serve as nurses and were called upon by the Public Health Service. As a result, the office was minus six of its clerks and stenographers for about two weeks. Miss Putman, who was one of the volunteer nurses, herself contracted the "flu" but recovered speedily.

VISITORS

Dean T.F.Hunt of the University of California, was an office visitor on November 22, to discuss the cereal smut control campaign now in progress in that State, and prospective cooperation in future cereal disease work.

PUBLICATIONS

Department Bulletin No. 698, entitled "Grain Sorghum Experiments in the Panhandle of Texas," by C. R. Ball and B. E. Rothgeb, under date of October 31, has been received for distribution.

A paper entitled "Corn-Rootrot and Wheatscab," by G. N. Hoffer, A. G Johnson, and D. Atanasoff, was published in the Journal of Agricultural Research, Vol. 14, No. 13, September 23, 1918.

MEETINGS

In connection with the convocation week meetings in Baltimore, the Botanical Society of America will place the genetical papers on its program for the morning of December 27. In the afternoon it will hold a joint sessio with the American Phytopathological Society, which will be a symposium on "Our Present Duty as Botanists". A dinner for all botanists will be held on the evening of December 27 and will be followed by the address of the retirin President, Professor F. C. Newcombe, on "Training for Research in Plant Industries."

The American Society of Agronomy will hold its annual meeting at Baltimore on January 6-7, in connection with the gathering of agricultural a related societies which center around the annual meeting of the American Asso ciation of Agricultural Colleges and Experiment Stations.

ADDITIONAL FARE NO LONGER CHARGED FOR USE OF PULLMAN ACCOMMODATIONS.

Memorandum No. 259. Use of Transportation Requests under Order of the United States Railroad Administration, Dated November 27, 1918

By order of the Director General of Railroads, additional passage charges in sleeping and parlor cars will be cancelled, effective December 1, 1918. Accordingly, on and after that date the procedure outlined in Memoran dum No. 241, as amended by Memorandum No. 257, governing the use of transpor tation requests, will be superseded by the procedure which obtained prior to June 10, 1918, i.e., one transportation request will be drawn on the rail road company to cover the railroad fare and, when sleeping or parlor car accommodations are used, a second transportation request will be drawn on the sleeping or parlor car company for the cost thereof,

D. F. Houston,

Secretary.

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BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

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December 10, 1918.
Field Station Issue.
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Vol.10 No.17.

FIELD STATION CONDITION AND PROGRESS, NOVEMBER 1918.

HUMID EASTERN STATES.

LOUISIANA.

Crowley Rice Station, Crowley (J. Mitchell Jenkins)

The totd precipitation for November was 6.64 inches. The first frost of the season occurred on November 12. On the 30th there was a little sleet.

By November 15 all crops on the station had been harvested. Fall seeding was delayed by bad weather. Since early October farmers have had only about one week of good weather for thrashing and during that time thrashing was difficult due to the wet condition of the lower part of the bundles.

GEORGIA.

State Experiment Station (Athens) and Substations (Prof. Loy E. Rast)

November 20. Our sowings are all made. At Athens our varietal experiments consist of 20 varieties of wheat on 14 varieties of oats, 5 varieties of rye and 13 varieties of barley. In addition to this, we have date-of-seeding experiments with both Appler and Fulghum oats, seeded October 15 to November 15, and Georgia Red and Fulcaster wheat, sown on the same dates. Rate-of-seeding experiments with both oats and wheat were made at the following rates per acre: 3, 4, 6, 8 and 10 pecks. All of these experiments are on one one hundreth acre plots.

We have 340 increase rows of wheat, the rows being 12 inches apart and 66 feet long; 265 rod rows of wheat; 140 rod rows of oats; 60 rod rows of rye and 12 rod rows of barley. We have 925 head rows, as follows: 305 wheat, 420 oats, 200 barley. Most of our nursery rows of both oats and barley were killed during the last two winters, and we are making a special effort to make up for these two past years by sowing larger numbers this year. With favorable seasons, we are expecting results that will reward us for the time and trouble in making and sowing these selections. We have three half-acre series divided into twentieth and fortieth acre plats on which we are conducting experiments with fertilizers, one being different dates of nitrogen applications in the spring.

At Tifton we have sown 14 varieties of wheat, 5 varieties of rye, 10 varieties of oats, and 12 rod rows of wheat. On one area we expect to apply nitrate of soda at different dates in the spring.

At Douglas we have planted 19 varieties of wheat, 5 varieties of rye and 10 varieties of oats. We also have plots seeded to oats on which nitrogen will be applied at different dates in the spring.

At the new area conducted in cooperation with Mr. J. W.Williams, at Statesboro in Bulloch County, we are now seeding 24 varieties of wheat, 4 varieties of rye, 12 rod rows of wheat, and hope to apply nitrogen at different dates in the spring on some of the oats.

I am pleased to report that all of the small grains at the Athens Station are up and making good growth during this warm weather, with the exception of wheat and oats seeded Nov. 18 which no doubt will be germinating before many days.

SOUTH CAROLINA.

West Raleigh. (G.M.Garren)

On account of the extreme scarcity of farm labor the members of the office force of the experiment station have had abundant opportunity during the fall season to renew their boyhood acquaintance with the mule and a Dixie plow in "turning the stubborn glebe". The many military training camps in course of construction in the State and in adjoining States absorbed all the available farm labor. Notwithstanding this serious handicap, all the experimental small grains were sown on schedule time and are now in excellent condition on all the branch station farms of the experiment station. The handicap from the lack of the usual efficient farm labor was overcome to a great extent by the very favorable weather conditions prevailing throughout the entire State during the time of seeding.

Another favorable circumstance is that the station staff so far has been very fortunate in escaping the influenza. No one of the staff in charge of the small grain work has been attacked. The most serious trouble experienced from this cause was the untimely death of one of the stenographers from pneumonia following influenza in the early stages of the epidemic. Inability to fill this vacancy at once delayed unduly the copying and mailing of the annual report of the cooperative small grain work. Also on account of the staff being so completely and for so long time occupied in the field work the office work has been of necessity neglected. This part of the work, however, now is being put in the best of shape as rapidly as time will permit.

The acreage seeded to wheat has been greatly increased throughout the entire State. In counties where the growing of wheat has not received any attention at all for many years considerable acreage has been seeded the past season. A greater percentage of the seeding was done early and under favorable conditions. The winter weather so far has been unusually mild but a little dry. At the present time the outlook for a very large wheat yield in the State is promising.

VIRGINIA.
Arlington Farm, Rosslyn.

The warm, dry weather which characterized October has continued throughout November. Owing to very light precipitation, winter grains have not made too much growth and will go into the winter in excellent condition. However, rain is much needed generally, as the supply of water in springs and wells in the surrounding country is very low.

During the month plat labels have been made and set and field work practically has come to a close.

NEW YORK.
Cornell Experiment Station, Ithaca (Dr. H. H. Love)

The weather this fall has been in general favorable to fall-sown grain so that, while it was necessary, owing to wet weather, to seed late, the indications are that the grain is going into the winter in very good shape. During the month of November, seeding of new hybrids in the greenhouse was done, as well as a considerable sowing of varieties to be used for crossing. A large number of new combinations have been seeded. These include a number of species crosses as well as varieties of commercial value. The seed sent to Chico arrived and Mr. Florell writes that it was all seeded in due season.

During the month counts were made on the third generation of a large number of oat crosses to determine the inheritance of ligule. Since the absence of ligule has never been found in the wild oat, this character is a very important one to study genetically and in crosses with the wild oat it is behaving differently than it does when crossed with domestic sorts.

n The work of cleaning the grain in preparation for seeding next spring is now under way. From the results obtained indications are that we have some new selections of barley and new hybrid combinations which may be of value for New York State. The taking of notes on wheat hybrids is now being completed preparatory to taking up the study of the oat hybrids in preparation for spring sowing.

MISSOURI.
State Experiment Station, Columbia. (No report)

IOWA.
State Experiment Station, Ames. (No report)

GREAT PLAINS AREA.

TEXAS
Amarillo Cereal Field Station, Amarillo. (No report)

OKLAHOMA
Woodward Field Station, Woodward. (John B. Sieglinger)

I arrived in Woodward yesterday afternoon, December 1. Everything seems to be in good shape for this time of the year. The recent rain and snow had stopped some of the field work. I was out looking at the last date-of-seeding plats and expect to have the grain hauled in tomorrow and thrashed.

KANSAS
Fort Hays Branch Station, Hays. (No report)

COLORADO
Akron Experiment Farm, Akron. (No report)

WYOMING
Cheyenne Experiment Farm, Archer. (A. L. Nelson)

During the first part of the month the spring grains were thrashed. Thrashing was completed on November 21. On November 5 and 6 we had a snowstorm which hindered thrashing, by drifting the snow over the shocks. The snow was removed and thrashing was continued. This was possible because the maximum temperature was low, ranging from 25 to 50 degrees.

All the grains from the plats, with the exception of flax, have been cleaned. The yields on the whole were very good. The bushel weights of the common wheats were low. Following are the acre yields:

Acre yields of Winter Wheat Varieties in Fortieth-acre Plots Replicated 4 Times, Twice on Disked Oat Stubble and Twice on Fallow.

Variety	C.I.No.	Disked on Oat Stubble.	On Fallow	Average
		Bu.	Bu.	
Buffum No. 17	3330	27.50	43.59	35.54
Kanred	5146	24.50	42.33	33.41
Ghirka Winter	1438	17.67	48.75	33.21
Crimean	1559	22.50	43.17	32.83
Kharkov	1583	23.00	41.75	32.37
"	1442	21.84	41.25	31.54
Crimean	1437	24.00	38.50	31.25
Malakoff	2908	21.75	39.92	30.83
Crimean	1432	21.59	40.00	30.79
Alberta Red	2979	18.42	42.67	30.54
Beloglina	1543	21.34	39.17	30.25
Turkey	2998	20.67	38.50	29.58
Crimean	1532	19.42	38.84	29.13
Amavir	1355-2-2	20.09	37.34	28.71
Turkey	1571	18.67	38.17	28.42

Acre yields of Spring Wheat Varieties in Fortieth-acre Plats Replicated 4 Times, Twice on Disked Corn Stubble and Twice on Fallow.

Variety.	C.I.No.	Disked on Corn Stubble	On Fallow	Average of 4 plats.
Common Wheats.				
Erivan	2397	37.75	44.59	41.17
Galgalos	2398	38.25	42.17	40.21
.....	4377	35.34	40.67	38.01
Amber Chaff**	4154	34.00	40.00	37.00
Marquis	3641	36.50	37.25	36.87
Kitchener*	4800	31.67	41.67	36.67
Huron	4935	29.25	38.25	33.75
Red Russian	4141	31.00	34.67	32.83
Rysting	3022	29.08	34.92	32.00
Power	3697	28.25	35.50	31.87
Preston	3081	28.84	34.50	31.67
Glyndon	2873	31.58	31.42	31.50
Pioneer	4324	27.39	30.50	28.94
Ghirka-Spring	1517	27.67	28.84	28.25
Prelude	4323	17.58	26.75	22.16
Haynes	2874	14.33	16.75	15.54
Ruby***	6047	....	26.00	....

Variety.	C.I. No.	Disked on Corn Stubble.	On Fallow.	Average of 4 plats.
Durum Wheats.				
Beloturka	1520	35.84	41.08	38.46
Acme	5284	34.33	40.33	37.33
Kubanka	4063	35.83	37.17	36.50
Pererodka	1350	34.50	38.50	36.50
Kubanka	1516	35.00	35.17	35.08
Arnautka	1493	35.17	33.50	34.38
Pelissier	1584	31.34	37.34	34.34
Monad	3320	36.50	31.59	34.04
D-5	3322	37.25	30.42	33.83
Marouani	1593	33.50	33.70	33.62
Arnautka	4064	32.00	32.67	32.33
Kubanka	1440	32.42	28.42	30.42

*One plat in each series.
**One plat in the fallow series.
***One plat in the fallow series only.

Acre Yields of Oat Varieties on Fortieth-Acre Plats Replicated Four Times, Twice on Disked Corn Stubble and Twice on Fallow.

Variety	C.I. No.	On Disked Corn Stubble	On Fallow	Average of 4 plats.
Kherson	459	71.57 bu. per acre	87.57 bu.	79.57 bu.
Golden Rain	493	76.72 " "	71.10 "	73.91 "
Sixty-Day	165	60.63 " "	85.79 "	73.21 "
Ligowo	492	74.07 " "	69.22 "	71.64 "
Abundance	731	67.35 " "	68.60 "	67.97 "
Richland	787	60.25 " "	73.28 "	66.76 "
Colorado	619	68.60 " "	61.88 "	65.24 "
Silvermine	714	65.47 " "	59.69 "	62.58 "
Albion	729	56.72 " "	61.41 "	59.06 "
Swedish Select	134	60.31 " "	57.35 "	58.83 "
Banner	732	55.47 " "	55.00 "	55.23 "
Black Tartarian	768	37.35 " "	38.29 "	37.82 "

Acre Yields of Barley Varieties on Fortieth-Acre Plats Replicated Four Times, Twice on Disked Corn Stubble and Twice on Fallow.

Variety	C.I.No.	On Disked Crn Stubble.	On Fallow.	Average of 4 Plats.
Sandrel	937	75.11 bu. per acre.	71.05 Bu.	73.08 bu.
Horn	926	65.84 " "	70.42 "	68.13 "
Italian	914	63.96 " "	69.17 "	66.56 "
White Smyrna	658	62.29 " "	66.25 "	64.27 "
Svanhals	187	63.34 " "	61.46 "	62.40 "
Trebi	936	57.71 " "	66.98 "	62.34 "
Coast	690	61.15 " "	57.71 "	59.43 "
Hannchen	531	56.04 " "	57.50 "	56.77 "
Odessa	927	52.08 " "	52.92 "	52.50 "
Himalaya *	620	47.50 " "	52.09 "	49.79 "
Manchuria	638	49.07 " "	45.21 "	
Black Hulless*	1106	43.65 " "	45.73 "	44.69 "
Horsford	877	40.42 " "	43.02 "	41.71 "
Blackhull	878	40.21 " "	42.50 "	41.35 "

* Calculated at 48 lbs. per bushel.

Acre Yields of Flax Varieties on Duplicate Fortieth-Acre Plats on Disked Corn Stubble.

Variety	C.I. No.	Acre Yield
Russian	19	14.29 Bu.
Stepan N.D.No. 1340	5	10.00 "
Montana Common	6	9.29 "
N.D. No. 52	8	8.93 "
Select Riga N.D.No.1214	2	8.22 "
Idaho Common	15	8.13 "
Fargo Common N.D.No.1133	18	8.04 "
Select Russian N.D.No.1215	3	7.77 "
N.D.R. No.114	13	7.50 "
Primost Minn. No. 25	12	5.89 "

SOUTH DAKOTA
Bellefourche Experiment Farm, Newell (Beyer Aune)

Acre Yields of Spring Wheat, Oat, Barley and Flax Varieties Grown at Newell, S. Dak., 1918.

Spring Wheat Dry Land.

Durum	C.I.No.	Bu.	Common	C.I.No.	Bu.
Pierson	4163	36.3	Huron	4935	32.7
Kubanka	1440-712	35.8	Power	3697	30.0
do	1440-735	35.3	Marquis	3641	29.3
Acme	5284	35.3	Prelude	4323	27.7
Kubanka	1516	34.9	Pioneer	4324	27.4
do	1440	34.5	Haynes	2784	26.9
Arnautka	4064	34.2	Manchuria	249238	24.8
do	1493	34.0	Preston	3081	22.7
Monad	3320	33.6			
Kubanka	1516-715	33.5			
D-5	3322	32.9			
Afriganski	3302-901	30.2			

Spring Wheat, Irrigation.

	C.I. No.	Bu.
Kubanka	1440	41.7
Pringle Champlain	4782	37.6
Marquis	3276	35.0
Power Fife	3025	35.0
Haynes Bluestem	2874	30.7

Oats, Dry Land.

	C.I.	Bushel per acre.
White Russian	551	47.6
Sixty-Day	165	41.1
Albion	729	40.2
Sixty-Day Selection	626	39.8
Richland	787	39.3
Kherson	459	37.8
Burt	293	36.4
Sixty-Day Selection	165-566	34.9
Swedish Select	134	34.6

Oats, Irrigation.

	C.I.	Bushel per acre.
Emmer	1524	88.0
Canadian	444	85.2
Silvermine	782	79.2
Swedish Select	134	77.9
White Russian	551	75.3
Sixty-Day	165	75.0
Lincoln	781	74.2
Pete Edwards	778	73.7
Abundance	780	72.7

Barley, Dry Land.

	C. I.	Bushels per acre.
Hannschen	531	23.6
Emmer*	1524	21.4
Odessa	182	20.0
White Smyrna	638	18.4
Coast	690	18.4
Minn. No. 6	638	18.3
Gatami	575	14.4
Himalaya	620	12.7
Nepal	595	8.7

Barley, Irrigation.

	C. I.	Bushels per acre
Trebi	936	75.9
Chevalier	530	74.3
Hannschen	531	66.9
Wisc. No.13	905	66.7
Coast	690	65.8
Himalaya	620	62.7
Nepal	595	51.6

*Yield of emmer computed at 32 lbs. per buchel.

Flax, Dry Land.

	C. I.	Bushels
Select Russian	3	13.1
N. D. R. No. 52	8	12.9
Primost	12	12.4
Russian	19	11.6
N.D.R. No. 114	13	10.1

Flax, Irrigation.

	C. I.	Bushels.
Select Russian	3	21.7
N.D.R. No. 52	8	20.8
Primost	12	20.5
Russian	19	19.1
N.D.R.No.114	13	15.5

NORTH DAKOTA
State Experiment Station, Fargo (Theodore Stoa)

Very favorable fall weather continued through November, with the result that the fall work has been well rounded up. Very little snow has fallen, and the temperature has been moderate.

The varieties of flax were recently cleaned and graded. Their respective acre yields are as follows:

N.D. No.	C.I. No.	Variety	Average yield 3 replications.
3080	8	N.D.R.No.52	24.8 bu.
3081	14	ND.R. No.73	24.5 "
	164	....	23.8 " *
3082	13	N.D.R.Bo. 114	21.2 "
1689	12	Primost	20.6 "
1133	18	Common	19.9 "
608	1	Sel. Russian	19.6 "
49001	165	Ann. Fiber	19.1 " *
1214	2	Select Rigaian	18.7 "
1221	16	Select Seed	18.2 "
155	17	Frontier	18.1 "
1215	3	Damont	16.4 "
609	45	Select Russian	16.3 "

* One plot only.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.)

The first half of November was generally cold and clear except for occasional snowstorms. The latter part of the month has been fair and not very cold so that most of the outside field work at the Station which was delayed so long because of the epidemic of influenza and the shortage of labor has been cleaned up. The maximum temperature for the month was 55°, recorded November 4, and the minimum was 3°, recorded November 23.

The clothes-wringer thrasher, designed by Mr. Sarvis last year has been improved upon and the tin work on it has been done by a professional tinner. It has proved more satisfactory in every way than was anticipated. It thrashed out the seed much better, cleaned it at the same operation, and did the work in considerably less than half the time taken by the old method. All of the flax nursery is now thrashed, which completes the field work here for the season.

Dickinson Substation, Dickinson (Ralph W. Smith)

During November, the weather, with the exception of a few cold spells, has been unusually warm and mild. On account of the present scarcity of labor and feed, the mild weather has been very acceptable, permitting farmers to get their fall work done, and allowing stock to graze without much feeding. The only severe weather occurred about a week ago when the minimum temperature was slightly below zero. What little snow fell disappeared in a few days.

Winter wheat and rye sown early in the fall in soil too dry for germination, began growing in November. When growth stopped about the middle of the month, some of this grain was on the point of emerging. Similar conditions prevailed a year ago. In the spring most of the winter wheat was dead while the rye emerged with fair to good stands.

Farm work in this vicinity has been delayed by the epidemic of influenza which has visited most of the rural homes as well as those in town. Many deaths have occurred.

The following are the yields obtained in the rate and date-of-seeding experiments with Kubanka, C.I. No. 4063. Duplicate plats were sown on three different dates at each of the following rates: 3, 4, 5, and 6 pecks per acre. It was planned to sow April 1, April 15, and May 1. Snow and stormy weather delayed the first two seedings.

Date Sown.		Rate per Acre.				Average Acre Yield.
		6 pk.	5 pk.	4 pk.	3 pk.	
April 5	Yield	20.8	21.9	22.5	20.5	21.4 bu.
April 22		16.6	19.1	19.5	16.4	17.9 "
May 1		16.5	16.6	18.3	15.0	16.6 "
Average		18.0	19.2	20.1	17.3	

The results show the best yields from the 4 peck rate for each of the different dates, and the earlier seeding yielded best for each of the different rates. The results from date-of-seeding experiments with Early Mountain oats and Hannchen barley were not very conclusive, due to injury from grasshoppers.

WESTERN BASIN AND COAST AREAS.

UTAH

Nephi Substation, Nephi. (Aaron F. Bracken)

December 5. At the station the ground is covered with at least 6 inches of snow and before the snow fell all fall grains had emerged. From present indications I feel sure of good yields of grain next season.

Average acre yields of winter wheat grown on triplicated twentieth-acre plats at Nephi Substation, in 1918.

Variety	C.I.	Bu.
Beloglina	1544	23.26
Alberta Red	2979	22.34
Kharkov	1442	21.00
Neb. No. 28	5147	16.91
Bulgarian	2048	15.48
Crimean	1437	15.32
Armavir	1355	15.27
Odessa	3274	10.16
Ghirka Winter	1438	9.91
Koffoid	2997	8.31
Wash. Hyb. No. 128	4326	6.72
Turkey	2998	5.44
Goldcoin	2996	2.16

Average acre yields of spring wheat grown on duplicated twentieth-acre plats at Nephi Substation, in 19[illegible]

Variety	C.I.	Bu.
Regenerated Defiance	5543	15.67
Little Club	4066	13.67
Arnautka	1494	12.49
Velvet Don	2247	11.83
Kubanka	1440	11.82
Chul	2227	11.67
Early Baart	1697	11.17
Mohamed Ben Bachir	2087	10.98
Pelissier	1584	10.33
Adjini	1594	10.17
Saumur	2346	9.67
Ghirka Spring	1517	9.50
Marquis	4158	9.33
Galgalos	2398	8.67
Kcola	2203	8.33
Pacific Bluestem	4067	7.17
Defiance	5542	7.17
Dicklow	3663	6.33

IDAHO

Aberdeen Substation, Aberdeen. (L. C. Aicher)

November 26. The whole farm here is now being prepared for irrigation. Fall sowings on the dry farm were not made this year. Dry farmers are rapidly buying irrigated land and some intend to run the dry farms in connection with a piece of wet land , thus insuring an income from year to year regardless of drought.

Average acre yields of winter wheat varieties grown in triplicated fortieth-acre plats, under dry land conditions at Aberdeen, Ida., in 1918.

Variety	C.I.	Bu.
Turkey	1558	5.5
Crimean	1437	5.2
Kharkov	1442	5.1
Turkey	1756	5.0
Theiss	1561	4.6
Turkey	1571	4.5
Alberta Red	2979	4.3
Armavir	1355	4.3
Beloglina	2239	4.2
Ghirka Winter	1438	3.9
Kanred	5146	3.9
Wash. Hyb.No.128	4326	3.9
Titanic	5537	3.6*
Argentine	1569	3.5
Goldcoin	5290	1.9

* Average of only 2 plats.

Average acre yields of spring wheat varieties in duplicated fortieth-acre plats, at Aberdeen, Ida., in 1918.

Dry Land

Variety	C.I.	Bu.
Little Club	4066	6.6
Pacific Bluestem	4067	6.0
Dicklow	3663	6.1
Kubanka	1440	5.6
Marquis	4158	5.3
Early Baart	1697	4.9
Galgalos	2398	4.6
Chul	2227	4.1
Talimka	2495	4.1
Kcola	2203-2	2.8

Average acre yields of spring wheat varieties in duplicated fortieth-acre plats, At Aberdeen, Ida., in 1918.

Irrigated

Variety	C.I.	Bu.
Dicklow (selection)		40.6*
" "		36.3
Dicklow	3663	35.6
Pacific Bluestem	4067	30.6
Regenerated Defiance	3703	29.0
Early Baart	1697	28.3
Marquis	3276	27.6
Bobs	2826	22.1

* 1 plat only.

OREGON

Harney Branch Station, Burns. (No report)

Sherman County Branch Station, Moro. (No report)

WASHINGTON

Adams Branch Experiment Station, Kind (M. A. McCall)

Rainfall for the year 1918 totals 6.77 inches as compared with a normal rainfall of 11 inches or better. This explains the crop shortage.

Our seeding is completed and while all of it is not up it seems to be germinating and getting along very well. Following the cold period just before and after Thanksgiving we had an open period.

We seeded 37 tillage plats, 19 organic disposal plats, 35 rate, date, and depth-of-seeding winter wheat plats, 30 rotation plats, 50 winter cereal variety plats, and 120 plats in the seed treatment - seed injury experiment. Our winter cereal nursery totals 1600 rod rows. All variety trials in the nursery include a smut resistance trial.

In order to lessen labor, plats were put in in duplicate instead of in triplicate as formerly. Had we been able to foretell the end of the war this would have been unnecessary.

CALIFORNIA

Plant Introduction Garden, Chico. (Victor H. Florell)

The seeding of the nursery was completed on November 21. Over 4500 rows were sown. A Moro nursery drill was constructed for this work, the utilization of which greatly facilitated the sowing operations

The emergence of all cereals has beendelayed by wet cool weather. However, nearly all varieties inthe field plats were emerged on November 26, and nursery barleys were emerged one day later.

Average acre yields of varieties of wheat grown in quadruplicated .017-acre plats at the Plant Introduction Garden, Chico, Cal. in 1918.

Variety	C.I.	Bu.
Little Club	4066	32.8
Dicklow	3663	30.7
Koola	2203-2	30.6
Marquis	4158	30.5
Wash. Hybr. No. 128	4326	30.3
Wash. Hybr. No. 123	4325	28.8
Talimka	2495	28.4
Fretes	1596-1	27.9
Galgalos	2398	25.1
Kharkov	1442	25.0
Wash. Hybr. No. 539	4327	24.5
Kubanka	1440	24.5
Salt Lake Club	3018	24.1
Wonga Australian	3019	22.6
Titanic	5535	21.8
Pacific Bluestem	4067	21.1
Propo	1970	20.7
Chul	2227-2	20.6
Early Baart	1697	19.7
California Gem	2986	19.7
Sonora	3622	18.7
Prohibition	4068	17.5
Bobs	2826	16.8
Abyssinian	2511-2	12.5
*Federation	4609	50.0
* "	4780	45.1

* Single .0085-acre plats.

Rice Field Station, Biggs (J. W. Jones).

The rainstorm of November 22 and 23 totaled 1.8 inches. At that time there was probably 20 per cent of the rice still out in Butte County, 30 per cent in Glenn County, and 20 per cent in Colusa County. The weather since the rain has been favorable, with north wind and cold nights.

Many thrashers began work on Tuesday following the rain. Warehouse keepers report that most of the rice thrashed since the rain has been very damp, and unless properly cared for may heat.

There was a great deal of rice banked out and piled on the main roads before the rain, and the bottom layer of sacks in these piles was quite wet in most cases. The piles were covered with straw which protected the upper sacks.

I have just returned from the Willows, Maxwell, Colusa, and Princeton districts, and from what I could see and learn practically all the thrashing in these sections is completed, but there is still a good deal of rice to be hauled into the warehouses.

The loss due to the rain will come from three sources. First, there will be a loss in thrashing due to toughness; second, there probably will be some loss from heating in the warehouses; and third, it is costing more to have the rice banked out and hauled to the warehouses due to bad roads. But with a few more good days practically all rice should be in the warehouses.

JAN 21 1919
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R.

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S.Dept. of Agriculture,
(NOT FOR PUBLICATION)

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Vol. 10. December 31, 1918. No.18.
Miscellaneous Issue.

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PERSONNEL (AGRONOMIC PROJECTS)

J. C. Brinsmade, Jr., Assistant in flax investigations arrived in Washington from the Northern Great Plains Field Station, Mandan, N. Dakota, on December 8, and will be at the office for some time for conference and the writing of his annual report.

Ross R. Childs, formerly in charge of the cereal experiments at the State Experiment Station, Athens, Ga., and substations, called at the office on December 21 on his way south on furlough over the holidays. He expects to be discharged soon from military service in the U. S. Aerial Photographic School at Cornell University and will resume his work with this office.

C. H. Clark and J. A. Clark have just recovered from influenza. Other members of their families are still affected.

F. A. Coffman, who resigned from Akron Field Station, Akron, Colo., to establish his title to his homestead at Mack, Colo., expects to relinquish his claim in favor of his brother and return to the work at Akron in early spring.

William A. Donn, messenger, is absent from the office with influenza.

Lieut. William C. Eldridge, formerly of Arlington Farm, has received his discharge from military service at Camp Taylor. He called at the office on December 18 on his way to Cornell University where he expects to complete his undergraduate work by June of next year.

M. A. McCall, superintendent of the Adams Branch Experiment Station, Lind, Wash. early in December was called to Oklahoma where his wife was ill with influenza. Mrs. McCall died shortly afterwards and Mr. McCall was stricken with the disease. He writes that he has recovered sufficiently to leave for Lind on December 28.

E. S. McFadden, who has been at Camp Lewis, Wash., since last spring, expects soon to receive his discharge from military service and will return to his work in charge of the cereal experiments at Highmore Field Station, Highmore, S. Dak.

Miss Gartrell is recovering from an attack of influenza from which she has been suffering since Christmas Eve.

Prof. Loy E. Rast, of the Georgia State College of Agriculture and Collaborator of this office, arrived on December 27 and is engaged in writing his report of the cereal work at Athens, Ga. and substations, which he has supervised since Mr. Childs entered military service.

John B. Sieglinger, in charge of grain sorghum and broomcorn experiments at the Woodward Field Station, Woodward, Okla., has been in Washington since December 17 for the purpose of writing his annual report and assisting in the preparation of a manuscript on the results of the experiments conducted during the past five years.

C.W.Warburton, the Agronomist in Charge of Oat Investigations, who has been detailed for several months in connection with the distribution of the President's seed loan fund in the Northern Great Plains district, with headquarters at Great Falls, Mont., is still engaged in that work. The taking of applications for the fund in connection with the seeding of fall grain has been completed and the taking of applications in connection with the seeding of spring grain was begun about the middle of December. The work will continue until the inspection of the fields has been completed, probably in May.

PERSONNEL (PATHOLOGIC PROJECTS).

REGULAR PROJECTS.

Dr. Lucile K. Bartholomew has been appointed Assistant Pathologist on a part-time basis, effective December 1. She will conduct seed-treatment experiments and germination tests in connection with the cooperative cereal smut investigations at the University of Wisconsin.

James Godkin, who has been engaged in the smut control campaign and more recently in a survey of certain counties in northern Georgia to locate the nematode disease of wheat, arrived at the office on December 28. He found the nematode infection prevalent in a small district of Jackson County.

Nellie E. Hunt has been appointed Field Assistant, effective December 1, to assist in inoculating and culturing rust in the experiments on the stem rust of wheat and biologic rust forms conducted in cooperation with the Kansas State Agricultural Experiment Station. Miss Hunt is a student of plant pathology at Kansas State Agricultural College.

Dr. A. G. Johnson, in charge of the investigation of diseases caused by fungi imperfecti and sac fungi, arrived in Washington on December 30, and will be here for two or three weeks.

Dean E. C. Johnson, formerly Pathologist in Charge of Cereal Disease Investigations in this office and for the past seven years dean of the division of extension at Kansas State Agricultural College, has accepted an appointment as dean of the College of Agriculture and director of the Experiment Station at the State College of Washington according to Science (48:619, Dec. 20,1918.)

Walter L. Plaenert has been appointed Field Assistant, effective December 3, to assist in the cooperative cereal disease investigations at Wisconsin Agricultural Experiment Station. Mr. Plaenert has studied at the University of Wisconsin and has had much farming experience.

S. Fred Prince has been appointed Field Assistant, effective December 1, to assist in preparing color plates of cereal rusts for the manuscript containing results of experiments conducted cooperatively by the Department of Agriculture and the Kansas State Experiment Station.

Eben H. Toole, Assistant in Plant Pathology and Physiology at Purdue University, has been appointed Assistant Pathologist, effective December 1, to assist in the cooperative investigations of corn diseases at Purdue University. He will have charge of the studies of the effects of the ions of various salt on the growth of both infected and disease-free corn seedlings and plants.

EMERGENCY PROJECTS.

Barberry Control Campaign.

Edward G. Amos has been appointed Assistant Pathologist, effective December 18. Mr. Amos has just received his discharge from military service as 2nd lieutenant in Field Artillery. He is a graduate of Michigan College of Agriculture where he received the degree of M.S., and during the years 1916 and 1917 was county agent of Dickinson and Schoolcraft counties.

Dr. E. D. Ball, since November Professor of Zoology and Entomology at Iowa State College and as State Entomologist still concerned with barberry eradication, was an office visitor on December 30, after the Convocation Week meetings in Baltimore.

W. E. Brentzel has been reappointed Assistant Pathologist, effective December 9, to assist in the barberry campaign. Mr. Brentzel was connected with the smut control campaign in the Great Plains district last spring. He left in June last to enter military service and has since been at Camp Pike, Arkansas.

J. T. Fowler, formerly field assistant in the smut control campaign has just received his discharge from officers' training school at Camp Taylor, Louisville, Ky. and has been appointed Assistant Pathologist effective December 11, for barberry eradication.

G.F.George, who is doing barberry campaign publicity work, is at the office at present engaged in producing an animated cartoon showing the life story of the stem rust. A new poster designed by him is about to be distributed.

Robert E. Hodgson has been appointed Assistant Pathologist, effective December 1, to assist in barberry eradication. Mr. Hodgson has just received his discharge from officers' training camp. He was at one time county agent of Lyon County, Minnesota.

Richard M. Holman, Field Assistant in barberry eradication, resigned November 24 and has returned to teaching at Wabash College, Crawfordsville, Ind.

John M. Holzinger, Professor of biology in Winona State Normal School, Winona, Minn., has been appointed Field Assistant, effective October 16. Mr. Holzinger has for many years been an enthusiastic botanical collector in different parts of the United States, notably in the northern Rocky Mountain region, and is well qualified to discover barberry plants which may be hiding in his district.

L. J. Krakover, in charge of rust over-wintering studies in the Eastern District, is at the office for conference with Dr. Stakman.

Dr. Louis H. Pammel, Field Assistant, has returned to his duties as Professor of Botany at Iowa State College. His resignation from the barberry campaign became effective December 9.

George M. Peterson has been appointed Field Assistant, effective December 1, to assist in the barberry work. Mr. Peterson during the past summer assisted in the white pine blister rust survey conducted by the Office of Forest Pathology.

Dr. E. C. Stakman arrived at the office on December 20 for conference and the completion of the stem rust circular and bulletin.

Harvey E. Vasey, formerly Associate Professor of Botany in the Colorado Agricultural College, died at Fort Collins, Colo. on December 10. At the time of his death he was second lieutenant in the Students' Army Training Corps, assigned as personnel adjutant, according to Science (48:619, Dec. 20, 1918). Mr. Vasey assisted in the work of the barberry eradication campaign during last summer and his death is greatly regretted by his co-workers.

Dr. E. Mead Wilcox, Field Assistant in barberry control, resigned December 11 to return to the University of Nebraska where he is head of the Department of Plant Pathology.

George R. Wildern has been appointed Field Assistant, effective December 3, to assist in the barberry work. He has just returned from France after six months service with the Y.M.C.A.

Smut Control Campaign.

Charles S. Reddy, who has charge of the Seed Treatment - Seed Injury work, is at present at the office for conference and to assist in planning the smut control campaign for next spring.

Dr. G. M. Reed, formerly Professor of Botany at Missouri College of Agriculture, arrived in Washington on December 30 to assume the leadership of the Cereal Smut Investigations project. Dr. Reed has for several years figured prominently as an investigator and teacher, and has published extensively on cereal smuts and powdery mildews. He has also carried on considerable research in cereal breeding for disease resistance and in the physiology of parasitism.

C. M. Scherer, who has had charge of the smut control campaign in Montana, has resigned to accept a position with the Davey Tree Surgery Institute, Kent, Ohio.

Noel F. Thompson has received his discharge from Camp Taylor Officers' Training School. He has been appointed Assistant Pathologist, effective December 1, and reported at Pullman, Wash., on December 17 to resume his work in the smut control campaign.

H. M. Woolman, leader of the smut control campaign in Oregon and Idaho has been at the office since December 16 for conference and compilation of the results of the campaign.

VISITORS.

H. P. Barss, Professor of Botany and Plant Pathology at the Oregon Agricultural College, has been in Washington for a few days, following the Convocation Week meetings at Baltimore, to discuss the cooperative smut control campaign and rust investigations in Oregon.

W. W. Robbins, Professor of Botany at Colorado College of Agriculture, has been a frequent office visitor during the last few days to discuss the cooperative campaigns for smut control and barberry eradication in Colorado.

A HAPPY NEW YEAR TO ALL.